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No. 41

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PROBLEMS OF INFLUENZA: PRESENT AND FUTURE

Moscow SOVETSKAYA MEDITSINA in Russian No 5, 1978 pp 3-7

/Article by Prof D. K. L'vov, corresponding member of the USSR Academy of Medical Sciences, Institute of Virology imeni D. I. Ivanovskiy of the USSR Academy of Medical Sciences, Moscow/

/Text/ Modern science does not have the means to prevent the annually occurring influenza epidemics. The existing system of prevention and treatment at best reduces the number of lethal outcomes and complications. However, it does not succeed in affecting the course of the epidemic process. The unique capacity of influenza viruses for variation of surface antigens--hemagglutinin and neuraminidase--is the basic reason for such a situation. This variation is of a dual nature: unpronounced, almost annually occurring changes in antigenic properties (antigenic drift) and a suddenly approaching, complete replacement of one or both antigens (antigenic shift). Probably, antigenic drift is due to the mutation process with a subsequent selection of clones possessing an epidemic potential under the pressure of population immunity. In the opinion of most specialists, antigenic shift is the result of the recombination process (hybridization) between human and animal viruses.

The epidemic influenza virus with new surface antigens appears suddenly, mainly in countries of South-East Asia, after various time intervals and as yet does not lend itself to forecasting, which is one of the basic reasons for our helplessness to control a pandemic that appears. The period from the first signals on the circulation of a new virus to the preparation of vaccines adequate in their antigenic content is too limited. Therefore, an early detection of the beginning of circulation of a new virus is very important. This task is solved by the service of strains and population immunity both on a national and global scale.

Strains differing in their antigenic structure isolated at the beginning and end of an epidemic period are of the greatest interest. The isolation of strains during an interepidemic period is of special importance. Therefore, it is important to organize an all-year round virological examination of patients with a clinical diagnosis of influenza before the appearance of a new epidemic virus. The laboratories engaged in systematic observations of the

circulation of viruses should identify the isolated strains in a maximally short time for the purpose of providing the appropriate institutions with materials for the preparation of vaccines and the production of diagnostic preparations.

Influenza A viruses are widespread among animals. Viruses of human origin can cause influenza infection under natural conditions--in swine, dogs, horses, cows and domestic and wild birds. The Spanish pandemic, which took more than 20,000,000 lives in 1918-1920, was caused by a virus close to the swine influenza virus. During the pandemic period the virus was transmitted from man to the swine population, adapted itself to these types of animals and subsequently continued to circulate autonomously. On the American continent an active circulation of the virus in the swine population has continued until recently, also infecting people periodically. At the same time, the involvement of swine in the circulation of epidemic viruses of the Hong Kong complex has been established everywhere. Thus, swine can be a reservoir of epidemic influenza viruses. According to the data by Soviet researchers, a prolonged autonomous circulation of epidemic influenza viruses has now also been detected among chickens [3].

Therefore, the introduction of epidemic viruses into the populations of domestic animals occurs quite often. Sometimes a reverse circulation of the virus from animals to man is also possible.

Along with epidemic viruses, epizootics caused by influenza A viruses, whose spread has not yet been noted among people, appear among domestic animals from time to time [9]. The overwhelming majority of these viruses have been isolated from domestic and wild birds.

Epidemic strains of the Hong Kong complex have often been isolated from wild birds in various regions of the Eurasian continent, including those not inhabited by man. The circulation of viruses with the Hong Kong type of hemagglutinin among animals was detected 5 years before the appearance of the Hong Kong epidemic virus. These data served as the basis for the assumption that the Hong Kong virus appeared as a result of recombination between the Asian virus and some other animal influenza virus with a corresponding hemagglutinin type. The formation of recombinants of influenza viruses of animal and human origin was reproduced many times in experiments in vitro and in vivo. If this process occurs just as easily in natural biocenoses (and we see no reason to doubt this), the appearance of pandemic viruses with a new set of surface antigens through an exchange of the gene pool between human and animal virus populations is quite natural.

The overall program of research on the ecology of influenza in the USSR envisages a study of the gene pool of virus populations circulating in nature, of the geographic and ecological patterns in the spread of influenza viruses, of the relationships between epizootics and epidemics and of the tendencies in the variation of viruses in natural biocenoses. About 20 support bases conducting research on the ecology of influenza viruses now function in the

country. More than 25 combinations of surface antigens (and only four or five known for human influenza viruses) have already been detected in animals. Viruses similar or analogous to Hong Kong and Asian viruses, as well as a number of viruses with previously unknown types of hemagglutinin and neuraminidase [6], have been isolated from wild birds. Nine of them have been detected only in the USSR. This year, using two viruses isolated from birds, we have been able to construct a recombinant-antigenic analog to the Asian epidemic virus in the laboratory.

The establishment of a museum of viruses with various sets of surface antigens and recombinants of these viruses with industrial epidemic strains, as well as the use of such archives for the preparation of vaccines during the appearance of a new epidemic virus with antigens related to one of the animal viruses, are a possible practical way out concerning the section of the ecology of influenza viruses.

The high frequency of formation of recombinants with an instantaneous replication of various influenza A viruses in one host is due to the fragmented nature of the virus genome. Therefore, a study of the structure of the virion, its individual components and their functions and of the patterns in virus replication is important not only theoretically. A comparative study of viruses of human and animal origin, as well as their recombinants, by methods of molecular biology, together with research on the ecology of viruses will ensure progress in understanding the appearance of new epidemic viruses and the development of ways of controlling the variation of influenza viruses. The data on the functional importance of the components of a virus particle along with the development of methods of dividing and concentrating them are necessary for the preparation of modern types of highly purified killed vaccines.

The disclosure of the mechanisms of reproduction and formation of influenza viruses is the prerequisite necessary for clarifying the most vulnerable aspects in the chain in intracellular transformations leading to the appearance of infectious virus progeny. This research is inherently connected with the possibility of a chemotherapeutic intervention in the infectious process. It is assumed that the performance of such research will make it possible to disclose the ontogenesis of the influenza virus and to determine the stages most vulnerable to the effect of chemopreparations. A study of the causes leading to the block of infection in systems resistant to the influenza virus is a logical continuation of this trend.

The existing types of live and killed vaccines against influenza are now the basic means of preventing influenza infection. Their use, not affecting the development of an epidemic significantly, makes it possible to lower morbidity and mortality to a certain degree.

The lack of correspondence of the antigenic components of anti-influenza vaccines to circulating strains is the basic factor lowering the effectiveness of the vaccine prevention of influenza. The length of the period of production and check of vaccines often leads to the fact that by the time of their

output a change in circulating strains has already occurred as a result of antigenic drift. The use of such vaccines is inadvisable. A sharp reduction in the period of preparation of vaccine strains is the solution for this problem. Among the different methods of obtaining vaccine strains for live vaccines only the use of recombinants can ensure the desired result. The use of the recombination method is a realistic possibility for the preparation of adequate live anti-influenza vaccines even in case of antigenic shift with the appearance of a new pandemic virus. The period between its identification and spread lasts 5 or 6 months and longer. The time necessary for the preparation of a vaccine strain can be shortened to 1 or 1½ months /11/.

Thus, the live vaccines against influenza first developed in our country under A. A. Smorodintsev's guidance serve as a highly promising means of prevention, including situations with the appearance of new pandemic viruses.

However, under any circumstances live vaccines will have a limited use for people with a high risk of complications and death from influenza, that is, for people with chronic diseases of the cardiovascular system, respiratory tracts and other diseases, patients above the age of 65 and children of pre-school age. At the same time, a mass use of live vaccines over a long-range period can ensure a significant decline in morbidity from influenza among the basic working population. The strength and length of immunity, the relative cheapness and simplicity of the preparation of live vaccines, the significant advantages of intranasal and peroral administration and the possibility of rapidly obtaining vaccine strains during recombination--these circumstances determine the prospects for the use of live anti-influenza vaccines as one of the basic preventive measures.

For the vaccination of people with a high risk of complications and death from influenza it is advisable to use inactivated (killed) vaccines. Their effect is based on the stimulation of humoral antibodies to surface antigens--hemagglutinin and neuraminidase--which, in the opinion of leading researchers, is sufficient to prevent infections. Not long ago there were difficulties with the adaptation of a new candidate for a vaccine strain to growth on chick embryos. This barrier was overcome by obtaining recombinants between the new virus and the one previously adapted to production conditions. This method, which sharply shortened the time necessary for obtaining a production strain of an adequate antigenic structure, ensured the possibility for an organization of large-series production of inactivated vaccines during the appearance of a new epidemic virus. According to the data of British researchers, this period lasts 6 to 8 months /12/, and according to the data of American specialists, 3 to 5 months /10/. The experience of American virologists in the preparation of vaccines against "swine" influenza can be cited as an example of a rapid preparation of vast amounts of vaccines during the appearance of a new virus. Mass production of the preparation was organized 5 months after the isolation of this virus, which confirms the reality of control of an impending epidemic.

The advances made in the study of the structure of the influenza virus, its components, methods of dividing and concentrating it and so forth ensured significant progress in the preparation of highly antigenic and purified inactivated vaccines. Modern types of vaccines are prepared with the use of zonal centrifuging or chromatography, as well as by means of adsorption on wide-porous glass. However, whole virus vaccines possess a more pronounced reactogenicity as compared with the latest samples of "split vaccines," which contain only the elements of the virus membrane. In the future there are prospects based on the determination of amino acid sequences in the composition of hemagglutinin and neuraminidase for obtaining synthetic antigens of influenza viruses [12].

The mass vaccine campaign conducted in the United States in 1976 detected an increase in the frequency of the Guillain-Barre syndrome among vaccinated people. Its indicator is approximately the same in all age groups and reaches 6.5 per 1,000,000, which, on the average, exceeds the frequency of appearance of this syndrome among unvaccinated people 11 times. The clinical manifestations of this syndrome in those vaccinated and not vaccinated are the same (progressive weakness, paralysis, disturbance in sensitivity, bilateral neurological symptoms, symptoms of affection of lower motor neurons and death in 6 to 10 percent of the cases). The mechanism of the provoking effect of inactivated vaccines on an increase in the frequency of appearance of this syndrome is unclear and is subject to a careful study. Under the conditions of an impending pandemic such a frequency of this syndrome will hardly serve as an obstacle for mass vaccination.

Methods of producing various types of highly purified and concentrated inactivated vaccines from a whole virus, not from subunits, are being mastered in the USSR.

In the future killed vaccines along with live ones, as well as with preparations inhibiting virus synthesis, will become part of the arsenal of the basic means of control of influenza epidemics.

During the periods of emergence of new pandemic influenza viruses the need for preparations for chemoprophylaxis and chemotherapy suitable for mass application is especially obvious. During the initial period of development of an influenza pandemic vaccines are still at the stage of elaboration. Nonvaccine antiviral preparations, including interferon and its inducers, can prove to be the only means of protection. During other periods of epidemic cycles these types of preparations can be used for the protection of groups with contraindications with regard to vaccination, as well as together with vaccines, for an overall prevention of infection.

The research screening of antiviral chemopreparations against influenza was not fruitless. One of the preparations (rimantadine) was recommended for early therapy and can also be used for an urgent prevention of influenza [1, 4, 5, 7 and 8]. An expansion of this section of work requires a pharmacological study of promising preparations, which as yet does not exist in practice.

Nonantigenic interferon inducers, polynucleosides, polysaccharides and so forth should also be classified with chemopreparations with a distinctive mechanism of action. On the whole, the development of inducers and the elaboration of the problem of interferon are highly promising.

An extensive research and directed screening of antiviral chemopreparations is conducted in several laboratories according to unified methods [2] in experiments on animals. Special attention is given to the most promising preparations of the adamantane series and to anomalous nucleosides. At the same time, the possible correlations of the chemical structure and antiviral activity are analyzed and recommendations are worked out for a directed synthesis of chemopreparations.

The 25th CPSU Congress especially stressed that among social problems there is no more important a problem than concern for the health of the Soviet people. The plan of measures of the USSR Academy of Medical Sciences for the implementation of the congress decision in the field of medical science and public health pointed out the development of an overall program for coordinated research on influenza for the Tenth Five-Year Plan as the most important. As the results expected for practice the fulfillment of the program presupposes an improvement in the forecasts of the appearance of influenza epidemics and the development and introduction of new preparations for the diagnosis, vaccinoprophylaxis, chemotherapy and chemoprophylaxis of influenza for the purpose of lowering mortality and morbidity.

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CLINICAL FEATURES OF INFLUENZA CAUSED BY DIFFERENT VARIANTS OF VIRUS TYPE A
(A2 AND A1)

Moscow SOVETSKAYA MEDITSINA in Russian No 5, 1978 received 13 Feb 78 pp
13-18

/Article by Ye. S. Ketiladze, L. D. Knyazeva, V. F. Krylov, A. A. Alekseyeva, L. A. Ivanova and S. G. Cheshik, clinical division (Prof Ye. S. Ketiladze, director) of the Institute of Virology imeni D. I. Ivanovskiy of the USSR Academy of Medical Sciences, Moscow/

/Text/ Major influenza epidemics caused by viruses type A are recorded all over the world almost annually.

A comparison of the clinical picture of influenza in hospitalized patients during the periods of epidemics caused by virus A2--Singapore (1959, 1962 and 1967), Hong Kong/1/68 (1969), England/42/72 (1972-1973), Port Chalmers/1/73 (1975) and Victoria/3/75 (1976)--and by virus A1 in 1977-1978 revealed certain features in the course of the disease.

More than 300 patients aged 15 to 85, in whom the diagnosis of influenza was confirmed in the laboratory, by the isolation of viruses from the nasopharynx and blood, by the detection of the influenza antigen in smears from the nose by the method of immunofluorescence and by a diagnostic rise in the titer of antibodies in paired blood serums in the hemagglutination inhibition reaction and the complement fixation reaction, were under observation.

Observations made over many years showed that the clinical manifestations of influenza A2 caused by different virus variants differed slightly from each other. However, during a detailed study of the clinical picture of influenza it was possible to reveal some of its features during the period of each epidemic. Influenza was most severe during the 1957-1959 pandemic caused by the Singapore virus (H2N2), although the course of the 1962, 1965 and 1967 epidemics was much more benign (Ye. S. Ketiladze et al., 1971; L. N. Lazukina et al.).

Influenza A2/Hong Kong (1969) during the period of a new pandemic wave was less severe than the 1957-1959 pandemic, but nevertheless was quite severe. The subsequent three epidemics of influenza A2 also differed. The epidemic

caused by the Port Chalmers virus was the most severe, and the one in 1976, the least severe. The 1972-1973 epidemic caused by the England/42/72 virus occupies an intermediate position (see table).

Clinical Symptoms of Uncomplicated Influenza in Adults During Epidemic Periods, %

(1) Симптом	(2) Грипп А1 (1977-1978)	(3) Грипп А2			
		(4) Виктория (1976)	(5) Порт-Чал- мерс (1975)	(6) Англия 42/72 (1972-1973)	(7) Гонконг (1969)
Острое начало (8)	97	94	98	98	88
Головная боль (9)	99	97	100	98	99
Головокружение (10)	43	16	35	24	40
Мышечные боли, ломота (11)	64	58	81	78	75
Рвота, тошнота (12)	14	8	21	14	24
Гипертензионный синдром, судороги, нарушение сознания (13)	8	7	11	9	17
Цианоз (14)	35	23	40	33	43
Геморрагии на слизистых оболочках (15)	8	3	11	7	5
Носовое кровотечение (16)	9	3	11	3	5
Насморк (17)	81	89	94	84	80
Средняя длительность насморка, дни (18)	4,3	4,3	5,1	3,5	5,8
Кашель (19)	95	97	94	93	96
Средняя длительность кашля, дни (20)	5,8	6,5	6,0	5,6	6,2
Трахеит (21)	25	25		30	43
Максимальная температура 39°C и выше (22)	61	66	76	83	82
Средняя длительность лихорадки, дни (23)	3,2	4,1	4,3	3,7	4,0
Лихорадка до 3 дней (24)	63	41	20	54	38
Форма гриппа: (25)					
тяжелая (26)	2	2	10	7	6
(27) среднетяжелая	94	95	87	90	92
легкая (28)	4	3	3	3	2

Key:

- | | |
|----------------------------------|---|
| 1. Symptom | 12. Vomiting, nausea |
| 2. Influenza A1 (1977-1978) | 13. Hypertension syndrome, spasms, disturbance in consciousness |
| 3. Influenza A2 | 14. Cyanosis |
| 4. Victoria (1976) | 15. Hemorrhage in mucuous membranes |
| 5. Port Chalmers (1975) | 16. Nose bleeding |
| 6. England 42/72 (1972-1973) | 17. Rhinitis |
| 7. Hong Kong (1969) | 18. Average duration of rhinitis, days |
| 8. Acute onset | 19. Cough |
| 9. Headache | 20. Average duration of cough, days |
| 10. Dizziness | |
| 11. Muscular and rheumatic pains | |

- | | |
|---|------------------------|
| 21. Tracheitis | 24. Fever up to 3 days |
| 22. Maximum temperature of 39°
and above | 25. Form of influenza |
| 23. Average duration of fever,
days | 26. Severe |
| | 27. Medium severe |
| | 28. Mild |

During all the epidemics influenza A2 was characterized by a rapid development of the symptoms of the disease, acute toxicosis, vascular disturbances and affection of the respiratory organs. However, during the period of the last epidemic of influenza A2/Victoria (1976) fever and toxicosis were more moderate and hemorrhagic manifestations and severe forms of the disease were observed more rarely, whereas during the period of the epidemic of influenza A2/Hong Kong, England/42/72 and Port Chalmers circulatory disorders were pronounced.

The differences detected in the severity of the course of influenza during various epidemics were caused by the virus itself. Apparently, some variants of viruses A2 possess pronounced toxigenic properties, which can explain the appearance of distinct symptoms of toxicosis, brain and pulmonary edema, the hemorrhagic syndrome, acute cardiovascular insufficiency and diffuse lesions of the epithelium of the mucuous membrane of the respiratory tracts.

In addition to viruses, bacterial complications affect the manifestation and outcome of the disease. A frequent association with staphylococcic infection is a feature of the severe forms of influenza A2. In these cases the pronounced nature of toxicosis and of the hemorrhagic syndrome increases and a rapid course of the disease or development of staphylococcic pneumonias distinguished by a tendency toward destructive processes in the lungs is observed. During the period of the last epidemics of influenza A2 an increase in the number of abscessing pneumonias and purulent pleuresies and a generalization of bacterial infection were noted (Ye. S. Ketiladze et al., 1977).

Thus, influenza A2, with the exception of some epidemic outbreaks, took a severe course, often with an unfavorable outcome in the presence of complicated forms of the disease, which is noted by a number of authors (D. M. Zlydnikov, 1970; A. A. Smorodintsev and A. A. Korovin; P. D. Starshov et al.; Gaida et al.; Schneider and Tischer; Vie-Dupont). Influenza epidemics caused by virus A2 were recorded for 20 years. At the same time, as of 1969 the Hong Kong virus (H3N2) predominated.

A new epidemic rise caused by virus A1, which had been the causative agent of epidemics in our country from 1949 through 1957 (F. G. Epshteyn), was noted in 1977-1978.

According to the data of serological investigations, the first cases of influenza among hospitalized patients were recorded in September 1977. The first influenza A1 virus was isolated on 1 November from a patient during an intrahospital infection. According to the results of an immunofluorescent investigation a distinct increase in the number of patients suffering

from influenza caused by virus A among adults began during the second week of November, when the frequency of the influenza antigen reached 30% of the total number of examined patients with acute respiratory diseases and remained at this level almost throughout December, declining during subsequent weeks and more sharply at the end of January (7%). In children a considerable increase in the frequency of affection with influenza was observed during the first week of December (up to 30%) with a rise during the third week (up to 38%) and a subsequent decline during the last days of the month and more sharply (up to 6%) during the last week of January.

It should be noted that, since the results of simultaneously conducted immunofluorescent investigation of smears from the noses of patients suffering from influenza with serums against influenza A2 and A1 viruses were identical, we classified the influenza antigen detected in November-December with virus A1. This is also confirmed by the high correlation of the data of immunofluorescence with the results of virological investigations conducted in these patients. Whereas the previous observations together with N. N. Zhilina et al. showed that by the method of immunofluorescence it is impossible to make a specific diagnosis of the varieties of virus A2, this principle can now also be applied to virus A1. The latter is due to the presence of a general complement fixing antigen, which makes it possible, when a new antigenic variant of viruses type A appears, to detect an increase in the antibodies to it in the complement fixation reaction.

An analysis of the clinical picture of influenza A1 was made in 274 patients (adults and children). The 1977-1978 influenza epidemic was characterized by the predominance (74%) of individuals of young age (15 to 30), primarily from organized collectives, among hospitalized adult patients.

The clinical picture of influenza A1 had all the symptoms peculiar to influenza infection. Basically, however, toxicosis was moderate. An acute onset of the disease and a rise in the temperature to maximum figures during the first 2 days were noted in most cases (97%). Headache with localization in the frontal region, pain in the eyeballs, general weakness, rheumatic pain in the body, muscular pains, dizziness, nausea, vomiting, sometimes faintness and spasms were the main complaints among adults (see table). One-third of the patients suffering from uncomplicated influenza had cyanosis of lips and mucuous membranes.

When the symptoms of influenza A1 and influenza A2 were similar, the intensity of manifestation during the former was lesser. The maximum temperature of 39°C and higher occurred less commonly (61%) and did not reach 38°C in 7% of the patients. Almost in two-thirds of the patients (63%) the duration of fever did not exceed 3 days. The average duration of elevated temperature (3.2 days) was shorter. General weakness and muscular pains were noted less commonly.

One can also judge the nonacute degree of toxicosis in influenza A1 from the comparatively rare leukopenia in the peripheral blood. Less than 6,000 leukocytes in uncomplicated influenza occurred only in 30% of the patients, at

least twice as rarely as during the period of previous influenza A2 epidemics. Nevertheless, the "meeting" between the patients, especially individuals of young age, and the new variant of the influenza virus was reflected in the frequency of the symptoms specific for influenza, primarily those indicating an injury to the nervous system--vomiting, nausea (14%) and dizziness (43%)--which were observed less commonly during the last influenza epidemic caused by virus A2.

Catarrhal symptoms in influenza A1 as compared with such in influenza A2 were moderate. Rhinitis was basically mild. It began on the first day of the disease and often later, its average duration being 4.1 days. Cough, primarily dry, usually occurred on the first day of the disease and in 25% of the patients was accompanied by clinical symptoms of tracheitis. However, tracheitis in group A1 as compared with tracheitis during the period of epidemic of influenza A2, including Victoria (1976), was also moderate, much less prolonged and rarely combined with laryngitis (4%). The average duration of cough was 5.6 days.

Lesions of the lower sections of the respiratory tracts with clinical symptoms of bronchitis, when short, dry and sometimes large-caliber, moist rales were heard against the background of a changed respiration, were not observed often in A1 influenza (12%). Bronchitis was pronounced mainly during an aggravation of chronic inflammation of the bronchi, but rarely in young patients (4%).

Severe forms of influenza during its uncomplicated course were observed in 2% of the patients aged 17 to 20, and mild forms, in 8%. It was not possible to detect significant differences in the manifestation of influenza A1 in 15- to 20-year old patients, who previously did not encounter this virus, and in older age groups, except for a much smaller number of patients hospitalized after the age of 40, although patients with severe forms of influenza were sent to the clinic. Furthermore, influenza in older patients was often manifested in a subfebrile temperature and moderate general toxic symptoms and the aggravation in their condition was due to the development of complications. A total of 80% of the patients above the age of 40 had a complicated course of influenza. Complicated forms of influenza A1 were observed in 40% of the hospitalized patients (in influenza A2, in 60%), in 20% of them as a result of pneumonias, which occurred less commonly in 15- to 20-year old patients (10%).

As bacterial pneumonia developed, toxicosis increased considerably, the temperature was higher (39°C and above, in 90%), fever was more prolonged and vomiting (30%) and weakness were noted more often, while the frequency of dizziness and hemorrhagic manifestations was the same. The average duration of fever was 6 days. All the patients had cough, often with a mucous or mucous-purulent sputum, and only some patients, with a mixture of blood. In most cases pneumonia was diagnosed according to clinical symptoms, but, in contrast to the influenza A2 epidemic, was segmental and polysegmental much more often, almost in one-half of the cases, and often followed the course of pleuropneumonia. As compared with the influenza A2 epidemic purulent complications, including abscessing pneumonias, were not noted.

Aggravation of chronic tonsillitis, sinusitis, pyelonephritis and aggravations of chronic diseases were classified with other complications.

Basically, severe forms of influenza were observed during a complicated course of the disease and in pneumonias (in 12% of the cases) in elderly and young patients. The severity of the patients' condition was mostly due to toxicosis, acute vascular or cardiovascular insufficiency, the development of collapse and hypoxemia and the appearance of diffuse changes in the myocardium, primarily as a result of massive bacterial pneumonias. Pronounced respiratory insufficiency predominated mainly in cases of concomitance of pneumonias against the background of accompanying chronic diseases of the bronchi and lungs. Extremely severe forms of influenza were observed much more rarely than during the period of the influenza A2 epidemic.

The course of the disease was favorable.

In children influenza also occurred with moderate toxicosis. Hemorrhagic manifestations were observed rarely. The duration of fever in uncomplicated influenza was 2.8 days. Catarrhal symptoms were moderate or mild, but more prolonged than in adults. The average duration of rhinitis was 6.7 days and of cough, 8 days.

Complicated forms of influenza (72%), mainly as a result of pneumonias (40%), predominated among hospitalized children aged 15 days to 15 years. Croup and catarrhal and purulent otitis were classified with other complications. Croup was observed rarely in influenza. It was primarily first-degree croup. Usually, it occurred on the first and less commonly on the second day after the onset of the disease and lasted from several hours to 1 day. A protracted course of croup was observed in one child as a result of bacterial infection caused by *Pseudomonas aeruginosa*. Pneumonias in children were more often focal and confluent-focal, but in 50% they were massive and in some patients followed the pattern of pleuropneumonia. It is important to stress that abscessing pneumonias were not noted in children suffering from influenza A1, in contrast to influenza A2.

Most probably, the sharp reduction in destructive processes in the lungs is due to a reduction in the relative significance of staphylococcus in the etiology of bacterial complications in influenza during the period of the influenza A1 epidemic. In influenza complicated by pneumonia staphylococcus in the sputum was detected twice as frequently as in the influenza A2 epidemic, which was reflected in serological indicators. A certain increase in the frequency of detection of pneumococcus more noticeable in the clinical manifestation of pneumonias was noted. *Proteus*, *Pseudomonas aeruginosa*, *Escherichia coli* and *Streptococcus hemolyticus* were also isolated from the patients' sputum and pharyngeal mucus.

In the influenza A1 epidemic, as in previous epidemics, in addition to combination with bacterial infection, the frequency of mixed virus infection increased in children and adults. Thus, according to the data of immunofluorescence, simultaneously with influenza the frequency of detection of

the RS-virus antigen (15%) and then of the adenovirus antigen (25%) increased in adults from the end of November. Mixed infection was 6%. In December the frequency of mixed infection in children increased (12%), mainly as a result of the detection of the RS-virus antigen (25%). In mixed infection in children, especially at the age of up to 3 months, in case of combination of influenza and RS-virus disease a severe course of the disease with pronounced symptoms of toxicosis, respiratory insufficiency, uncompensated respiratory acidosis and pronounced hypoxemia and hypercapnia was observed. Clinical symptoms of RS-virus infection were manifested in bronchitis and bronchiolitis. In these cases pneumonia often took a protracted course. Adenovirus infection in combination with influenza also changed the clinical picture of the disease, but in one-third of the older children and in adults it occurred in latent form.

The effect of RS-virus infection on the course of influenza in adults was manifested in a greater degree of evidence of bronchitis and in several young patients there were difficulties in a differential diagnosis of the disease. However, in adults RS-virus infection was detected more often during an aggravation of chronic bronchitis and in patients with frequent pneumonias in anamnesis. We also observed an increase in the frequency of mixed virus infection during the period of previous epidemics, which is not characteristic of influenza A1.

The study of the clinical picture of influenza during various epidemics caused by viruses A2 (H2N2 and H3N2) showed that with a great similarity of the disease there were some differences peculiar to each epidemic.

The clinical manifestations of influenza A2 were more severe, primarily during the development of pneumonias, especially staphylococcal. During the 1977-1978 epidemic period influenza A1, as compared with influenza caused by different variants of virus A2, was noted for a much more benign course. A lesser intensity of toxicosis and affection of the respiratory tracts was noted. Staphylococcal pneumonias and very severe forms of the disease were observed rarely.

It should be noted, however, that the influenza A1 epidemics of past years were not identical. The first was milder than the two subsequent ones. Therefore, influenza remains a serious scientific and clinical problem.

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EPIDEMIOLOGY

UDC 616.15-097.2:576.858.23(Hepatitis)J-078.7

EPIDEMIOLOGICAL AND CLINICAL SIGNIFICANCE OF LONG-TERM CARRIAGE OF THE AUSTRALIAN ANTIGEN (HB-Ag)

Moscow SOVETSKAYA MEDITSINA in Russian No 5, 1978 received 15 Apr 76 pp 35-39

/Article by V. I. Chimbru, R. A. Kantorovich, M. Ye. Semendyayeva, I. L. Blinkov, N. Yu. Loriye, D. V. Belokrinskiy, S. A. Grannikova, N. I. Zaozerskaya, O. I. Tovstyko and I. M. Yevgeniyeva, Institute of Epidemiology and Microbiology imeni N. F. Gamaleya of the USSR Academy of Medical Sciences, academic group of Ye. M. Tareyev, academician of the USSR Academy of Medical Sciences, Moscow City Blood Transfusion Station

/Text During the last decade a considerable number of studies have touched upon the problem of the relationship between the Australian antigen (HB-Ag) and virus hepatitis. It was established that the carriage of HB-Ag among the healthy population varies, according to the data by O. V. Baroyan et al., from 1.4 to 6.7%. In patients suffering from virus hepatitis this percent rises to 47 (Ye. A. Paktoris et al.). According to the consolidated data by A. F. Blyuger et al., HB-Ag is detected in 40% of the patients suffering from virus hepatitis, in 62% of the patients suffering from serum hepatitis, in 15-45% of the patients suffering from chronic hepatitis, in 32% of the patients suffering from liver cirrhosis and in 40-42% of the patients suffering from liver cancer. The carriage of HB-Ag among donors of the blood service comprises 0.81-3.45% (T. V. Golosova et al., 1975), in particular in Moscow 1% among primary and regular donors and 0.5-0.6% among unpaid donors (O. I. Tovstyko and I. M. Yevgeniyeva).

As indicated in the reports of the WHO Committee of Experts (1973 and 1975), the role of HB-Ag carriers, especially donors of the blood service, in the spread of hepatitis is topical and insufficiently studied, despite many investigations (T. V. Golosova et al., 1974; M. D. Aleynik and T. F. Ryabikova; G. S. Glazkova et al.; A. I. Marchuk et al.; K. Ya. Khersonskaya et al.; Gilles; Woolf et al.; Feinman et al., 1975).

It is assumed that a long-term carriage of HB-Ag can be due to the ability of hepatitis viruses to persist in the human organism. This was demonstrated experimentally on volunteers (Neefe et al.; Stokes et al.), as well as by

means of a virological and cytogenic study of leukocyte cultures in various groups and virus carrying donors (A. K. Shubladze et al., 1972; I. F. Barinskiy et al., 1968; I. V. Dement'yev et al.; R. A. Kantorovich et al., 1973).

According to the data by a number of researchers (S. N. Tsybulyak; G. S. Glazkova et al.; Ye. I. Logostayeva and V. N. Smirnova; A. B. Orekhovskaya and B. A. Kalyuta; T. B. Sorokina and R. N. Labovskaya; S. N. Tsybulyak and T. I. Fatakhova; Fainaru and Levij; Gilles; Ichida et al., Feinman et al., 1975; Klatskin), in donors--long-term carriers of HB-Ag--it is possible to detect biochemical and morphological changes characteristic of a chronic liver affection. Other authors (G. A. Sinayko et al.) did not find similar changes in donors with a persisting HB-antigenemy.

The possibility for a natural (nonparenteral) transmission of HB-Ag from HB-Ag carrying donors to the people around them is admitted by some authors (T. V. Golosova et al., 1975) and denied by others (M. D. Aleynik and T. F. Ryabikova; A. F. Shevchenko et al.; Mosley).

The object of this work included the study of the incidence of acute virus hepatitis in families of donors--long-term carriers of HB-Ag--establishment of the possibility for a natural (nonparenteral) transmission of this antigen to family members, investigation of the frequency of latent forms of chronic hepatitis in donors--long-term carriers of HB-Ag--and their family members, determination of some factors in the nonspecific immunobiological reactivity of the bodies of donors--long-term carriers of HB-Ag--and detection of the dominant subtypes of HB-Ag.

To solve the indicated problems, an epidemiological enquiry by means of a questionnaire of the families of 421 donors removed from donorship in 1973-1975 in connection with the detection of HB-Ag in their blood was carried out and 177 people in 97 families of carrier donors were examined for the presence of HB-Ag. Comprehensive clinical and laboratory investigations of 141 donors and 181 members of their families were conducted. A total of 49 healthy donors without antigenemy formed the control group. The donors and relatives in whom clinical and laboratory changes were detected were examined in dynamics two or three times with an interval of 3 to 6 months. The level of bilirubin in the blood, activity of serum transferases (alanine and asparagin), indicators of sedimentation tests, presence of HB-Ag and of the antibodies to it in the serum (in the counter immunoelectrophoresis reaction) and the subtypes of HB-Ag (in the agar gel precipitation reaction) with the use of a monospecific test system prepared at the Institute of Epidemiology and Microbiology imeni N. V. Gamaleya of the USSR Academy of Medical Sciences were determined in them.

An indirect test indicating the presence of a virus infection was also used in this study. Furthermore, spontaneous fructosuria, the concentration of immunoglobulins according to Mancini, complement titer according to 50% hemolysis and content of general protein and serum albumins were determined

and hypergammaglobulinemia was detected by means of the iodine test. In individuals with pronounced clinical and biochemical changes a puncture biopsy of the liver was performed in a hospital.

According to the data of the epidemiological enquiry by questionnaire, affection with acute virus hepatitis was noted in 1 out of 241 HB-Ag carrier donors. Among the 1,141 relatives living with the examined families one person (sister of a carrier donor) contracted acute virus hepatitis. In the past, however, this person had parenteral interventions and contact with patients suffering from Botkin's disease, which does not make it possible to connect this disease directly with the transmission of HB-Ag from the carrier brother.

Thus, according to our data the incidence of acute virus hepatitis among the family members of HB-Ag carrier donors (1 out of the 1,141 examined people) does not exceed the average level of incidence of virus hepatitis in Moscow.

In a clinical and laboratory examination hepatitis in anamnesis was detected in 4 (3.03%) donors and in 13 (8.02%) members of their families. Splenomegaly was noted in 7 (5.3%) donors and in 8 (5.1%) relatives.

In the majority of HB-Ag-positive donors the activity of transferases was increased, sedimentation tests were changed and hypergammaglobulinemia, increased fructosuria and so forth were detected. Thus, alanine transferase was increased in 76 (61.7%) HB-Ag-positive donors, in 23 (24.2%) relatives and in 2 (9.5%) HB-Ag-negative donors. The difference is statistically significant ($P < 0.01$).

A significant rise in the level of serum transferases (101 to 300 units) was detected in 11 HB-Ag-positive donors and in their three relatives.

A significant increase in fructosuria ($P < 0.01$) was detected among HB-Ag-positive donors and their relatives, which makes it possible to assume the presence of a virus infection in them. Hypergammaglobulinemia was detected in 9.4% of the HB-Ag-positive donors, which is significantly higher than among their relatives (2.9%) and in the control group (4.2%).

The differences in the frequency of changes in the level of complement among the groups proved to be statistically insignificant.

A special section of the investigations was devoted to an investigation of the levels of immunoglobulins (IgA, IgM and IgG) in the compared groups.

The levels of the three basic categories of immunoglobulins were determined in 107 donors--long-term carriers of HB-Ag--in 85 of their relatives and in 20 clinically healthy donors without HB-Ag (control group).

An analysis of the data obtained showed that in HB-Ag-positive donors the content of IgA and IgM was statistically significantly higher ($P < 0.01$) than in the control group. The level of IgG was higher in the control group. However, the difference was statistically insignificant (see table). Significant differences in the levels of immunoglobulins of all three categories were not detected between HB-Ag carrier donors and their relatives.

Levels of Basic Categories of Immunoglobulins in Examined Groups $\overline{M \pm m}$

Обследованные (1)	Число обследо- ванных (2)	(3) Уровень		
		IgA	IgM	IgG
HB-Ag-положитель- ные доноры (4)	107	295,36 \pm 9,69*	163,62 \pm 5,70*	1305,54 \pm 57,87
HB-Ag-отрицатель- ные доноры (контроль) (5)	20	224 \pm 12,29	118,2 \pm 5,10	1378,0 \pm 56,50
Родственники HB- Ag-положитель- ных доноров (6)	80	307,4 \pm 10,57*	180,34 \pm 6,52*	1369,63 \pm 62,08

*The difference in the indicator as compared with control is statistically significant ($P < 0.01$).

Key:

- | | |
|-----------------------------------|---------------------------------------|
| 1. Examined individuals | 4. HB-Ag-positive donors |
| 2. Number of examined individuals | 5. HB-Ag-negative donors (control) |
| 3. Level | 6. Relatives of HB-Ag-positive donors |

The level of IgG proved to be higher in three donors with HB-Ag, in whom a morphological study of the liver biopate detected chronic hepatitis.

A reexamination of 141 HB-Ag-positive donors after 3 months to 2 years showed that in 124 (80.8%) of them HB-antigenemy remained in titers 1:4-1:64. Among 177 relatives of the donors HB-Ag was detected in 8 (4.5%) and antibodies to HB-Ag, in 2 (1.1%). However, four out of eight relatives with HB-Ag had serum hepatitis or numerous parenteral interventions in the past. Thus, the frequency of HB-Ag carriage in the families of the relatives of donors--long-term carriers of HB-Ag--comprised 2.26%, which only slightly exceeds a similar indicator among Moscow's healthy population (1.1% according to M. A. Kasavina's data). The difference is statistically insignificant ($P > 0.05$).

In contrast to T. V. Golosova et al. (1975) we did not succeed in establishing a dependence of the frequency of detection of HB-antigenemy in the donors' relatives on the height of the HB-Ag titer in the serum of a carrier donor.

The AY HB-Ag subtype was determined in 52 out of 57 HB-Ag carrier donors and in all the examined relatives, including in all cases of family carriage of HB-Ag (four families with two carriers in each). The predominance of this subtype was noted in donors in our country (I. F. Barinskiy et al., 1975; R. A. Kantorovich et al., 1975; I. A. Marchuk et al.), as well as in donors in Italy, Greece, Romania, Israel, Australia and other countries, in contrast to donors in northwestern England, Canada, the United States, FRG, Sweden and Japan, in whom the AD HB-Ag subtype was determined more often (Manacelli et al.; Cruceanu et al.; Shalamith et al.; Gust; Perry and Choudhary; Green and Turner; Mitsuyoshi et al.; Feinman et al., 1973).

Depending on the degree of liver affection all HB-Ag carrier donors and their relatives were divided into four groups. The first group consisted of eight donors and three relatives with marked clinical and biochemical changes, in whom chronic hepatitis was suspected. These individuals were hospitalized for a thorough examination and puncture biopsy. The second group consisted of 40 donors and 16 relatives with less pronounced, but very persistent biochemical and clinical changes. They were ambulatorily examined in dynamics. A chronic diffuse liver affection was also suspected in nine people. The third group consisted of 38 donors and 23 relatives with insignificant biochemical changes (biochemical microsymptomatology). The fourth group consisted of 55 donors and 130 relatives without clinical, biochemical or immunological shifts.

Puncture biopsy performed in eight donors and one relative made it possible to detect chronic active hepatitis in three donors, chronic persisting hepatitis in four donors and albuminoid and fatty degeneration in one donor and one relative (the latter, however, had serum hepatitis earlier).

Conclusions

1. The incidence of acute virus hepatitis and the spread of HB-Ag among the family members of donors--long-term carriers of HB-Ag--on the average, do not exceed those in Moscow.
2. In a number of donors--long-term carriers of HB-Ag--chronic hepatitis was detected and a rise in the levels of IgA and IgM and the predominance of the AU HB-Ag subtype (91.3%) were established.
3. The high frequency of latent forms of chronic hepatitis in HB-Ag carrier donors and the high percent of laboratory microchanges in them point to the need to examine them and to provide dispensary services and treatment for them.

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INSTRUMENTS AND EQUIPMENT

UDC 615.849.19.015.4

BIOLOGICAL BARRIER ON SURFACE OF A LASER INCISION

Moscow KHIRURGIYA in Russian No 4, 1978 pp 99-102

[Article by S. D. Pletnev, M. Sh. Abdurazakov and O. M. Karpenko]

[Text] The possibility of using the laser beam as a "beam scalpel" is considered to be one of the most interesting perspectives in the application of lasers in medicine. It has been established that a focused CO₂ laser beam ("beam scalpel") has a whole series of advantages over other incision instruments which are used in surgery: sterility of the surface of the wound, limited bleeding of the wound, absence of cellular elements in the wound, smooth postoperative period, etc. (S. D. Pletnev and coauthors, 1976; B. M. Khromov and coauthors; A. A. Vishnevsky, Jr.; A. K. Polonsky; Polanyi and coauthors; Stellar and coauthors, and others).

The study of the pathomorphology of the laser wound is a current problem related to the increased interest on the part of the medical community in the "beam scalpel" and in its widened scope of application.

In experiments conducted earlier it was noted that the surface of the wound inflicted by the "beam scalpel" was covered with necrotic masses in the form of a thin coagulating film. Visual followups on the animals operated upon allowed us to suggest that the given coagulating film is a type of biological barrier which prevents the contents of the wound from penetrating into the surrounding healthy tissues.

The following study was undertaken with the purpose of confirming this hypothesis.

Epidermal-muscle wounds inflicted by a laser beam and by a surgical scalpel served as the experimental model. In all 40 animals (half-grown male rats weighing 150-200 g) were operated on, and these were divided into two groups of 20 animals each depending on the type of incisive instrument used. A CO₂ continuous laser with an emission power of 15-20 watts and a focused beam diameter not greater than 1 mm was used in the experiment.

Under ether anesthesia a standard epidermal-muscle incision in the region of the external surface of the upper third right dorsal extremity was made by a CO₂ laser beam. The wound was immediately filled with dye (trypan blue) in such a way that it did not go beyond the edge of the wound. As a control, an analogous incision was made by a surgical scalpel on the left extremity. The wounds were not sewn and the dye remained in the wound from 30 min to 6 hrs and trypan blue was periodically added to the incision as the quantity of the dye decreased. After 30, 60 min and 6 hrs the animals were sacrificed. Biopsies were taken of the wound surface which were then fixed in 10-percent neutral formalin and prepared in paraffin blocks. The histological sections were dyed with hematoxylin-eosine.

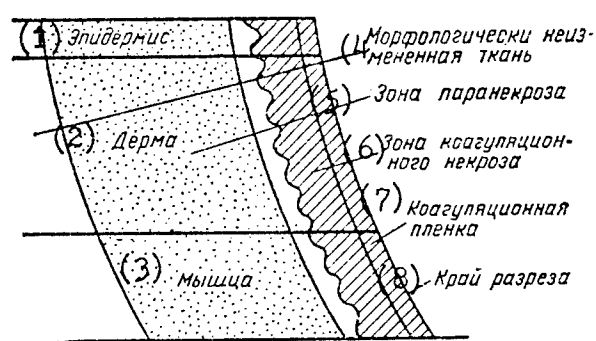


Figure 1. Schematic representation of individual zones of a laser wound and the distribution of the dye within them.

- Key:
1. Epidermis
 2. Dermis
 3. Muscle
 4. Morphologically unchanged tissue
 5. Zone of paranecrosis
 6. Zone of coagulating necrosis
 7. Coagulating film
 8. Edge of incision

A gas CO₂ laser beam incision in the zone of the laser radiation (in the epidermis, subcutaneous fatty tissue layer, and in the muscles) resulted in certain pathomorphological changes, which we conditionally separated into two zones: Zone 1 is the zone of the coagulating necrosis and Zone 2 is the zone of paranecrosis. The coagulating necrosis zone consists of a surface coagulation layer which is represented by a homogenous, protein-fused mass with a large number of vacuoles, which were either empty or partially filled with exudate and individual fragments of charred tissue. The width of this layer reached 45-90 mcm. Underneath this layer there was the remaining zone of coagulating necrosis, where an extreme degree of destruction was noted. These alterations extend for 200-300 mcm. In the zone of destructive changes, the alterations were variously expressed and the tissue structure was partially preserved. It was greater in extent than the

former and reached 450-750 mcm. For a better graphic representation of the results we used a modified scheme of that proposed by Hernandez-Richter and Struck in 1970 (Figure 1). The coagulating necrosis zone in the laser wound can be conditionally compared to the central zone of the scalpel wound, and the second zone of destructive changes corresponds to the peripheral zone according to the schema of the authors cited above.

The introduction of trypan blue into the wound and an examination of the specimens after 30 min showed that some irregular imbibition of the dye into the coagulating layer takes place. The layer was strongly colored by trypan blue, but it did not penetrate into the vacuoles. Thus, the coagulating layer was completely imbibed with the dye, and no coloring of the underlying part of the zone of coagulation was registered (Figure 2, see insert). In several specimens there were places where the coagulating layer seemed to be separating from the underlying tissue, i.e., its integrity was destroyed. Apparently, was the result of the animal's activity, the traumatization of the operative zone, and so forth. In similar cases, the dye leaked into the coagulating zone. The tissue coloring in these cases had irregular contours and boundaries, but the dye did not penetrate into the paranecrotic zone.

An analogous distribution of trypan blue was found also after it was present in the wound for up to 60 min.

Most interesting was the study of specimens in which the trypan blue had been in the wound for 6 hrs. Almost along its whole length the coagulating layer had been penetrated by the dye. In addition, trypan blue was also found in the upper layers of the coagulating necrosis, taking up approximately three-fourths of the width of that zone. However, no penetration of the dye into the paranecrosis zone was noted (Figure 3, see insert).

Changes which occurred in the tissue which had been cut with a surgical scalpel were of a different pathomorphological type. First of all, destruction of the tissue was in a smaller area (350-650 mcm), which did not have clear boundaries with undamaged tissue. The changes were characterized by varying degrees of destruction and were not accompanied by a coagulating necrosis, and there was general widespread bleeding. Upon introducing trypan blue into the wound it was noted that the dye was irregularly distributed along the zones of destructively altered tissue and it covered an area of 300-500 mcm, and sometimes it was even observed in the morphologically unchanged (Figure 4, see insert). This was the picture of the dye in contact with the wound surface from 30 min to 1 hr. After 6 hrs the trypan blue was found not only in destructively altered tissue, but also in intact tissue (Figure 5, see insert, and Figure 6).

Thus the results of our studies indicate that the zone of coagulating necrosis which is found on the surface of a laser incision can be considered a biological barrier, which prevents the penetration of dye (trypan blue) into the morphologically preserved tissues.

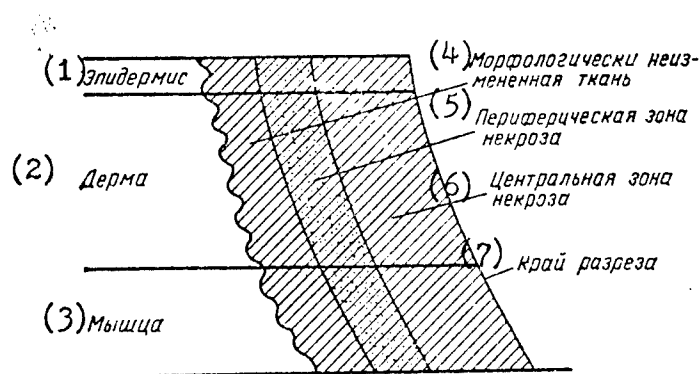


Figure 6. Schematic representation of individual zones of a scalpel wound and the distribution of the dye within them.

- | | | |
|------|-------------------------------------|--------------------------------|
| Key: | 1. Epidermis | 5. Peripheral zone of necrosis |
| | 2. Dermis | 6. Central zone of necrosis |
| | 3. Muscle | 7. Edge of incision |
| | 4. Morphologically unchanged tissue | |

Conclusions

1. The zone of coagulating necrosis which appears on the surface of a wound after a "laser beam" incision is imbibrated with the dye depending on the length of time that it is found in the wound and prevents the penetration of trypan blue into the morphologically unaltered tissue.

2. Upon introducing the dye into the wound made by a surgical scalpel, it was noted that the dye became actively distributed along the zone of destructive changes with subsequent penetration into the morphologically unchanged tissue.

3. The zone of coagulating necrosis which appears on the surface of the laser wound should be considered a biological barrier which prevents the penetration of the contents of the wound into the surrounding healthy tissue. It is expected that the use of a "beam scalpel" in clinical oncology in the removal of malignant tumors will result in a significant decrease in recurring postoperative tumors.

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MICROBIOLOGY

A NEW DISEASE OF THE POTATO FOUND IN BELORUSSIA CAUSED BY COLLETOTRICHUM ATRAMENTARIUM (B. ET BR.) TAUB

Minsk DOKLADY AKADEMII NAUK BSSR in Russian No 6 78 pp 561-564

[Article by academician of the Belorussian Academy of Sciences N.A. Dorozhkin, S.I. Bel'skaya and F.A. Popov, the Institute of Experimental Botany imeni V.F. Kuprevich of the Belorussian SSR Academy of Sciences]

[Text] Questions about the evolution of parasitism of fungi have great scientific-theoretical and practical significance. This process is especially pertinent to disease pathogens which effect plants, including those which effect the potato. The evolution of parasitism of *Phytophthora infestans* occurred parallel to and was closely connected with the evolution of its basic plant hosts, *Solanum tuberosum* and *Solanum lycopersicon* in their native country, Mexico. As a result of the introduction of the potato into Europe, a process of adaptation began by various forms of microorganisms to the new plant, rich in hydrocarbons and nitrogen substances. At the present time, dozens of fungi in various states of adaptation to the nutrients contained in potato cells can be removed from the diseased nodules of the plant. Some of these typical fungi are saprophytes (*Fusarium* sp.), obligate parasites with complex physiological specialization (*Ph. infestans*), and facultative forms. The study of potentially dangerous facultative parasites and saprophytes has special practical significance in light of a considerable number of cases of their massive epiphytotic transformation into obligate parasites. One of the facultative parasites which we studied in Belorussia is the pathogen which causes phomosis of the potato, *Phoma solanicola* (*Ph. exigua* var. *exigua*); a disease which results in significant and progressive damage (1,2). Recently, another new potato disease has appeared in the Belorussian SSR--antracnosis (dark brown black decaying nodules, black pitting of the stalks)--caused by the fungus *Colletotrichum atramentarium* (B. et Br.) Taub.

The first report of this disease in the USSR was made in 1963 by Lasman (3). It was found in tubers of the Stolovyy 19, early Priyekul'skiy and Falenskiy varieties, and was subsequently noted in the Leningrad area in 1969 and 1972 (4). Lately, antracnosis of the potato has been widely disseminated in the United States (5), England (6), Poland (7), the German Democratic Republic (8), and in other countries. According to the data of Wenzl, loss from it can amount to 60 percent of the harvest.

In Belorussia, we first detected antracnosis of the potato in tubers of the early Belorussian, Zor'ka, and Detskosel'skiy varieties in 1975 in the Minsk, Grodnenskiy, and Vitebsk areas. Up to three percent of the tuber crop was diseased. Antracnosis in vegetating plants is especially damaging. It has been found that the early varieties of the plant are particularly vulnerable. The disease does not develop annually, but does occur primarily in dry and hot weather (1975).

In tubers, the disease appears in the form of necrotic spots with indistinct borders of a dark-gray color, which are frequently all located on the stolon part of the plant. The disease infiltrates the tuber to a depth of 5-7 millimeters. With rising temperature and humidity, the disease develops in the form of wet rot (figure 1,a). Black microsclerotia are formed under the skin of the tuber and on its surface.

The stalks are effected most often at the beginning of the second vegetation period, evidenced by the formation of light colored spots which, with rapid development of the disease, can completely cover the stalks. In dry weather, the disease appears in the form of wilting of the stalks. In rainy weather, the stalks rot, are softened, and can be easily pulled out of the soil, as is seen in the disease of wirestem. In infected plants, a mass of microsclerotia with hyphae, measuring 136.0-272.0 microns, is formed (figure 1,b). They can remain sterile or form cavities with conidia, measuring 2.0-6.0x13.6-20.4 microns. The characteristic feature of antracnosis is the development of disease in the subterranean parts of the stalk. By this process, the disease disrupts the surface tissue of the skin, which can be readily removed to observe the characteristic violet or blue coloring of the internal layers of skin. Sclerotia on the subterranean parts of the plant are large carbon-like forms, distributed individually or in groups. Sometimes chlorosis of the plant tops and curling of the leaves of the cover slip are observed.

Study of the morphological-culture indices of *C. Atramentarium* isolates in various nutrient media indicates that they develop

1. Развитие антракноза на стеблях картофеля в период вегетации

3. Сорт	2. Развитие болезни по годам, %					
	1975 г.			1976 г.		
	VII	VIII	IX	VII	VIII	IX
4. Белорусский ранний	5,0	23,6	25,0	1,0	2,5	12,5
5. Огонек	3,5	8,0	10,0	0,3	0,8	4,5
6. Темп	—	1,5	2,0	—	—	0,5

1. Development of antracnosis on potato stalks in the vegetation period.
2. Development of disease by year, percent.
3. Variety
4. Early Belorussian
5. Ogonek
6. Temp

well in artificial environments, particularly in potato-glucose, grape agar, and Leonian media. In oat agar and Chapek media, the growth of the colony is slower, and the sclerotia are formed less rapidly.

We determined that *C. atramentarium* is characterized by significant resistance to heat. The mycelium and sclerotia are able to develop in a temperature range from 5 to 38° C (figure 2). The optimal conditions for growth and sporogenesis are created at 25-26° C. At an air temperature lower than 5 and higher than 38° C, mycelial growth is not observed. We noted that deviation of temperature from the optimal values leads to a decrease in the dimensions of the sclerotia.

The humidity of the air has definite significance for the development of the fungus. With rising humidity, the development of mycelium and the formation of sclerotia increases, however, saturation with 100 percent humidity inhibits these processes. The optimal conditions for the development of *C. atramentarium* are formed at 90 percent relative air humidity. Nevertheless, the fungus can develop at lower values of humidity, but humidity lower than 32 percent causes death of the fungus.

Study of its response to different media indicates that the rate of growth and formation of the sclerotia of the fungus depends to a significant degree on the culture conditions. At a pH of 3 or 11, the sclerotia do not develop, but a slightly acid medium, close to neutral (pH 6-7) is favorable for their development.

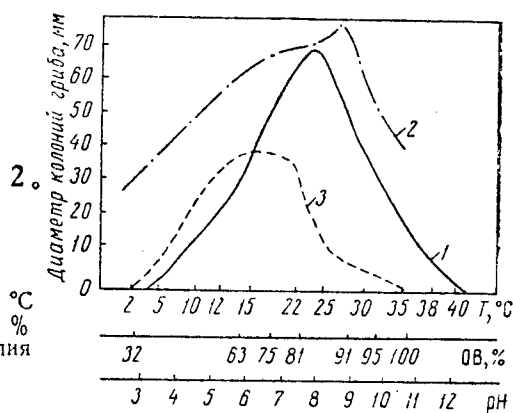


Рис. 2. Влияние температуры воздуха, °С (1), относительной влажности воздуха, % (2) и реакции среды pH (3) на рост мицелия *C. atramentarium*

1. Figure 2. Influence of air temperature, degrees C (1), relative air humidity, percent (2), and effect of media pH on the growth of the mycelium of *C. atramentarium*.
2. Diameter of the fungus colony, millimeters.

By means of artificial infection of different families of plants, we determined that the fungus effects principally representatives of the family solanaceae. In our experiments, sclerotia with hyphae were formed rapidly on the fruits of tomato and pepper plants, and subinfections of the stalks in forms of the species *Datura*, *Phisalis* and others were observed. In weeds found in potato fields such as field thistle, shepherd's purse, and knot-weed, the fungus also appears in the form of a subinfection. The sclerotia of *C. atramentarium* were observed only on the stalks of white orache. Root crops of carrots, beets, and radishes were not effected. Data on infection of eggplants and corn are available in the literature (7).

The ready growth of the fungus in artificial nutrient media, atrophied plant parts, and post-harvest remains is evidence of retention by the fungus of saprophytic properties. However, the antracnosis pathogen is sufficiently well adapted to parasitism in the potato and effects all the fundamental organs of a living plant: stalks, stolons, and tubercles.

Thus, in Belorussia, a new disease of the potato has been observed -- antracnosis. Because it represents a significant threat to this crop, we have directed the attention of potato growers and phytopathologists to the need for familiarity with its symptoms, accurate diagnosis, and further detailed study of the disease.

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COMPARATIVE EVALUATION OF THE DAMAGING ACTION OF RUBY CRYSTAL Q-SWITCHED
AND ARGON LASERS ON FILTRATION APPARATUS

Moscow VESTNIK OFTAL'MOLOGII in Russian No 3, 1978 pp 22-29

[Article by Academician of AMN SSSR, Professor M. M. Krasnov, Candidates of medical science G. G. Ziangirova, V. S. Akopyan, and G. G. Litvinova, All-Union Scientific Research Institute of Eye Diseases]

[Text] The outlook for the extensive use of lasers to treat wide-angle glaucoma has been noted in a number of works of domestic and foreign authors (M. M. Krasnov, 1972; M. M. Krasnov et al., 1973; Hager, 1973, 1975; Worthen and Wickham, 1974; Spitnas and Kreiger, 1974).

Two types of lasers are used to affect the structure of the angle of the camera bulbi anterior during glaucoma--ruby crystal Q-switched and argon. By now the number of clinical observations that characterize the effect of lasers of both types on the structure of the angle of the camera anterior exceeds the number of experimental and morphological studies that is governed by the lack of an experimental model whose drainage system would be equal to human. The monkey eye has the greatest similarity to the filtering zone of the human angle of the camera anterior. As a result in the majority of publications morphological studies have been conducted on the eye of monkeys, and human eyes enucleated or subject to enucleation (Vogel and Schildberg, 1973; Rassow, Wittchell, Unger, Perkins, Bass, 1974; Worthen and Wickham, 1974).

There is a discrepancy in the clinical and morphological evaluations of the effect of the argon laser on the structure of the angle of the camera bulbi anterior: clinical data indicate the stability of the normalization of the intraocular pressure after trabeculopuncture (Hager, 1973), while during morphological studies conducted on nine eyes enucleated within 24 and 36 hours after the procedure penetration of the trabecular tissue and its connection with Schlemm's canal were not discovered. Worthen and Wickham (1974) in experimental studies on monkeys revealed with the help of a scanning electron microscope destruction of the trabecular network which diminished the farther from the center of the burn. Spitnas and Kreiger (1974) in experiments on monkeys also indicated the possibility of the destruction of trabecular tissue, and of blood after coagulation entering from Schlemm's canal, into the camera

anterior, however they noted an exacerbation of drainage in six months after orbicular cauterization of the trabecula.

During laser puncture with the help of a ruby crystal Q-switched laser a relatively stable clinical effect is noted (M. M. Krasnov et al., 1973). Microscopic studies of trabecular zone in monkeys during the action of a modulated ruby crystal laser impulse described by M. M. Krasnov et al., (M. M. Krasnov et al., 1974; M. M. Krasnov, 1974), indicate the possibility of obtaining a through hole in the inner wall of Schlemm's canal.

The purpose of this report is to make a comparative study of the damaging action of ruby crystal Q-switched and argon lasers on the structure of the angle of the camera anterior of enucleated human eyes, as well as on the draining apparatus that can be dissected during trabeculectomy.

Material and method

A total of ten enucleated eyes were studied: six eyes with intraocular tumors of the posterior section, as well as four eyes of individuals who had died suddenly (the patients ranged in age from 40 to 61). One of them, a man 56 years old, had suffered during life from open-angle, far-set, operated on, compensated glaucoma. Laser goniopuncture was conducted with a domestic ruby crystal Q-switched laser (energy of impulse 0.2J, diameter of focal point 0.2-0.3mm), and laser trabeculopuncture--by an argon laser of the firm "Coherent Radiation" model 800 (radiation power in the impulse 1.0-1.5w, exposure 0.1s, diameter of focal point 50 m). In the beginning the laser procedure was conducted on an unopened eyeball with the help of a gonioscope, however due to the rapidly developing opacification of the cornea further studies were conducted on specially prepared units that contain a drainage system. Their technique of preparation was as follows: the eyeball was lanced in a vertical or horizontal direction, and the central block was left for normal histological study. In the anterolateral sections under the binocular magnifier ciliary body was separated and a block was prepared that contained the trabecular tissue, Schlemm's canal, and sclera; in a number of cases the ciliary body and iris were preserved. The block was placed in a Maksimov chamber filled with physiological solution, the chamber was covered with a cover glass, through which coagulation of the filtration apparatus was conducted. Then light and scanning electron microscopy were conducted. For study with a light microscope the blocks were filled with paraffin and stained according to the standard technique of hematoxylin-eosin. The control was the draining apparatus of an eye in the central block and a block not subject to coagulation. For scanning electron microscopy blocks were prepared by the method of freeze drying with passage of freon 13 through the critical point, and were covered with gold or gold-palladium. The preparations were examined with the help of a microscope 106ASEM of the firm "Coates and Welter Instrument Corporation" and Leits-AMR1000. A total of 37 blocks of 10 eyes were studied.

Microscopic picture of the control blocks and the central blocks indicated the lack of autolytic changes in the tissues of the filtration apparatus of the enucleated eyes. During cultivation of the blocks with drainage system it was found that the trabecular endothelium was capable of proliferation.

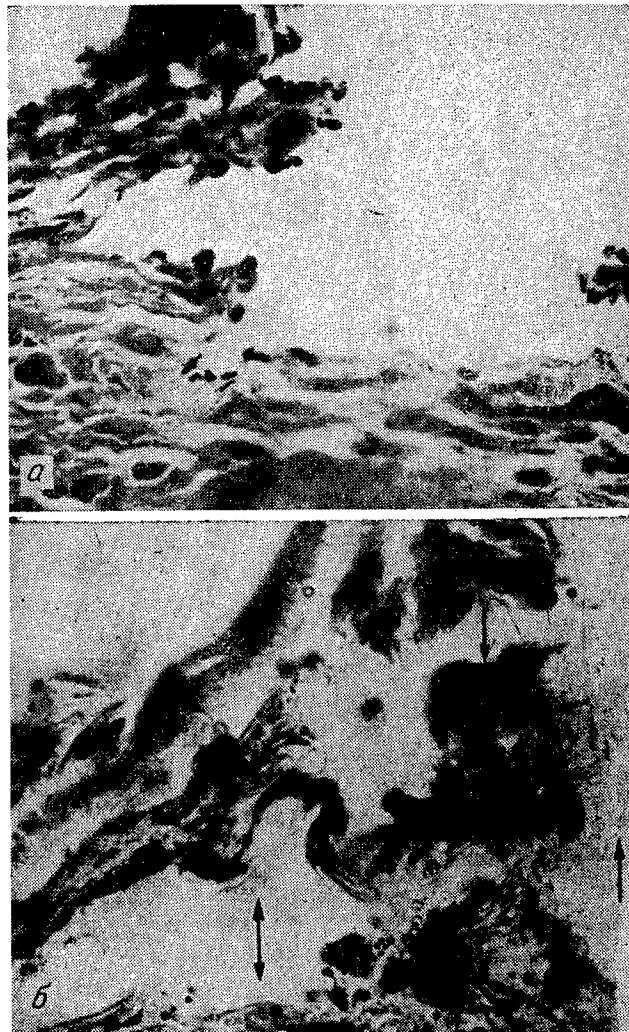


Figure 1. Damaging Effect of Ruby Crystal Q-switched Laser on Drainage Apparatus of the Eye (light microscopy).

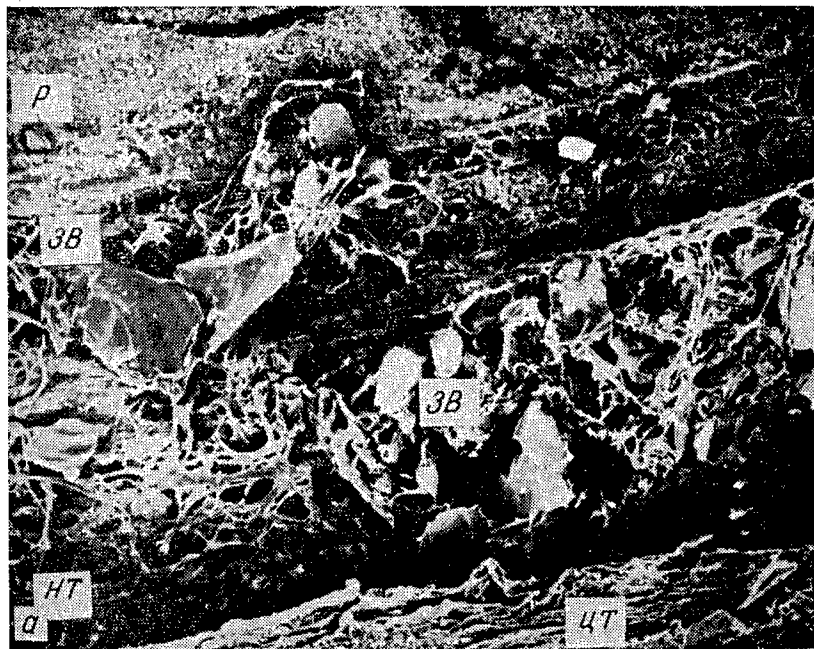
Key:

- a-- Through destruction of trabecular tissue and inner wall of Schlemm's canal, X 320; b--zone of evaporation of trabecular tissue. Zone of coagulation necrosis. Zone of contusion with thinning and rupture of trabeculae, X 500.

Morphologically in the zone of action of the Q-switched ruby crystal laser penetrating or almost penetrating destruction of the trabecular network was noted, as well as formation of a defect in Schlemm's canal. In the region of passage of the laser beam three zones of tissue damage were distinguished: 1) zone of complete destruction with evaporation of tissue whose dimensions with beam diameter 0.2-0.3mm equaled 125-625 m; 2) zone of partial destruction (necrobiosis) that limited the edge of the wounded canal, here a through rupture of the collagen rods of the trabecula, disruption of the integrity of the cellular and nuclear membranes of the endothelial cells, escape of the nuclear chromatin, and necrobiosis of the cytoplasm were observed; dimensions of this zone with a width of the through hole from 125-625 m were from 6-12.5 m 3) zone of contusion action with sharp expansion of the intratrabecular spaces, which created the impression of the formation of cavities in the drainage apparatus; in the trabeculae themselves numerous ruptures, cracks, and thinning of the basal membrane and collagen rods were noted; in dimensions this zone was several times larger than both the previous, and with the deep layers intact it spread to the middle layers of the sclera and the entire filtration apparatus in the section (figure 1, a-b, 2, a-b).

In the zone of necrobiosis the tissue of individual trabecular fibers were affected nonuniformly: some of them had the appearance of shadows--the collagen rods in them were completely destroyed, and in others formation of numerous cystoid cavities was noted, which indicated its partial fusion, and in others a through rupture was observed with fiber-scattering and swelling of the collagen which increased the thickness of the trabecula. Disruption of the integrity of the collagen stroma, its fragmentation and grain breakdown of the trabeculae were especially demonstrative during phase-contrast study. Destruction of the endothelial cells and their nuclei was expressed to a lesser degree, sometimes the integrity of the nuclear membrane was preserved on the background of complete destruction of the collagen fiber, and only the nuclear chromatin acquired graininess.

In the zone of the contusion action there was considerable increase in the distance between the trabeculae, and they lost their rectilinearity in the basal membrane and collagen rods; numerous ruptures, cracks and thinnings were defined. The nuclei of the endothelial cells mainly preserved their normal shape. During coagulation of the uveal section of the trabecula the muscle of the ciliary body was exposed to laser radiation in the zone of its attachment to the scleral spur. In these cases an expansion was noted in the intermuscular and suprachoroideal space, as well as the ruptures and thinning of the muscular bundles. In the intermuscular spaces cystoid cavities were formed part of which communicated with the suprachoroideal (figure 3, a-b, 4, a-b).



(Key on next page)

Figure 2. Changes in Trabecular Tissue under the Influence of Ruby Crystal Q-switched Laser (scanning electron microscopy).

Key:

a -- overall view, HT-normal trabecula; 3B -- zone of action of ruby crystal Q-switched laser; P -- cicatrix; T -- ciliary body, X106; 6 -- section of edge of trabecular tissue rupture. Tp -- trabecula; 3B -- zone of action, X 2100.

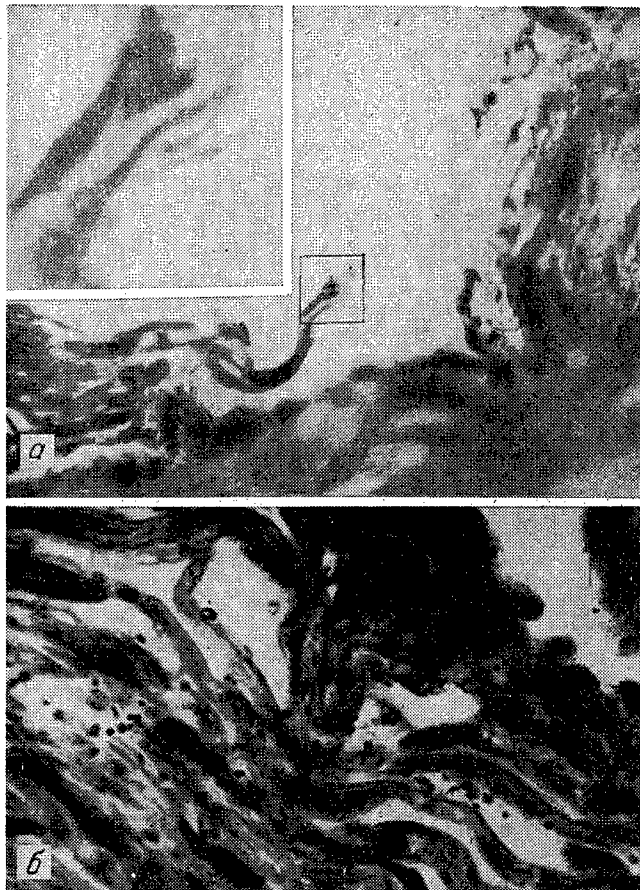


Figure 3. Damaging Action of Argon Laser (light microscopy)

Key:

a -- rupture and fiber-scattering of trabecula, X 200; 1250: 6 -- rupture of trabecular tissue in surface layers, expansion of intratrabecular fissures in deep layers with far-set, uncompensated open-angle glaucoma, X 800. Staining with hematoxylin-eosin.

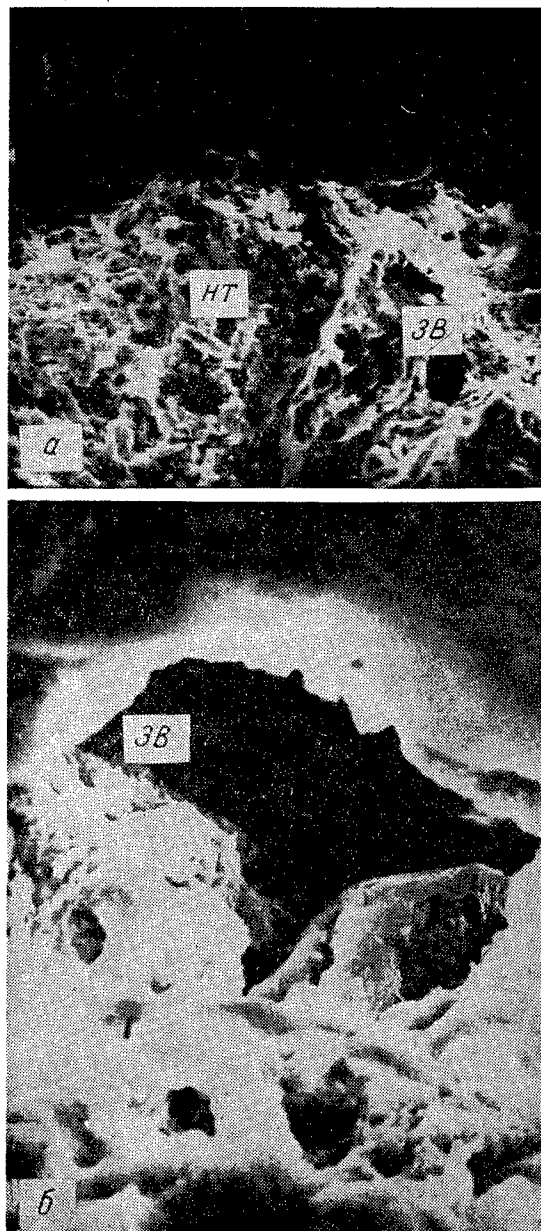


Figure 4. Changes in Trabecular Tissue under the Influence of Argon Laser
(Scanning electron microscopy)

Key:

a--overall view, HT--normal trabecula; 3B--zone of action, X 350; b--3B--
zone of action, X 2100

The wall of Schlemm's canal in zone of evaporation was destroyed all the way to the sclera, and in the zone of the coagulation effect necrosis was observed of the endothelial cells with destruction of their nuclei and release of chromatin. In the zone of the contusion effect isolated and multiple ruptures were found in the inner wall. The dimensions of the defects were from 10-12.5 m.

The zone of contusion damage with the use of Q-switched laser was not limited to the tissues adjacent to the region of the through defect, but was spread considerably wider: with the preservation of the deep layers foci of destruction and the formation of cystoid cavities were noted in its middle layers. In these sections multiple ruptures were detected of the scleral fibers, expansion of the spaces between them, and in one block a rupture was found in the aqueous vein for a considerable distance.

With the effect on the filtration apparatus of an argon laser in the region of damage two zones were distinguished: 1) zone of complete destruction, fusion and evaporation of tissue (80 m); 2) zone of necrobiosis, forming the edge of the wounded canal (250-280 m). The edges of the defect were nonuniform with fragmentation of the trabecular tissue and formation of conglomerates of tissue of the drainage system isolated from each other and in a condition of destruction and coagulation necrosis. The deep layers of the sclera were damaged; fusion of the scleral fibers and their numerous ruptures were noted. Schlemm's canal in the zone of direct action due to the destruction of the internal layers of the sclera was not differentiated. In the zone of necrobiosis the conglomerate of destroyed tissues was formed in which it was difficult to guess the contours of the trabeculae and the nuclei of the endothelial cells in the state of karyorrhexis. The collagen stromata of the destroyed trabeculae had scattered fibers and were swollen. In the tissues of the drainage system directly adjacent to the zone of necrobiosis an expansion was noticed in the intertrabecular fissures, and in the sclera--an increase in the spaces between the scleral fibers.

In one of the eyes in which we used to study the damaging action of laser radiation glaucomatous changes were discovered in the filtration apparatus that consisted of a thickening in the basal membrane and the collagen stroma of the trabeculae, constriction of the intertrabecular spaces, and reduction in the number of endothelial cells. In the intertrabecular spaces a large accumulation was observed of pigment granules, and the inner wall of Schlemm's canal was shifted to the outside thus producing constriction in its lumen. During action on the drainage apparatus of the glaucomatous eye of the argon laser only local damage was revealed in the surface layers of the filtration apparatus with a rupture of single trabeculae (their end sections had scattered fibers and were swollen); through destruction of the trabecular network was not observed.

Discussion

Despite the fact that the damaging action of ruby crystal Q-switched and argon lasers was studied on enucleated eyes and blocks with drainage system we

consider it possible to a certain measure to extrapolate the obtained data on living systems of the human eye.

In a comparative study on the damaging action of the ruby crystal Q-switched and argon lasers on the tissue of the drainage system of enucleated eyes a varying mechanism was revealed for their action. The ruby crystal Q-switched laser was characterized by a greater damaging (rupturing) capability than the argon laser, which is combined with the commotio syndrome along the periphery of the focus of direct action of the laser beam. Commotio changes are connected with the shock mechanical action of the laser impulse, and are manifest in multiple ruptures in the sheets of the trabecular frame, in the expansion under the influence of the shock wave of intertrabecular fissures and suprachoroideal space, intermuscular spaces of the ciliary muscle adjacent to the scleral spur, as well as in the scattering of fibers and ruptures of the scleral fibers in the middle layers. Analogous zonality of tissue damage to the iris membrane during the action of a ruby crystal laser has been described by G. M. Nikol'skaya (1977).

Peculiarities of the action of the ruby crystal Q-switched laser are a rupturing and crushing effect with minimum coagulation along the edges of the zone of evaporation, and the presence of a contusion zone. It can be assumed that activation of draining of the intraocular liquid must be greater during the effect of the ruby crystal Q-switched laser due to the through destruction of the trabecular apparatus and the inner wall of Schlemm's canal, as well as due to the commotio syndrome, in whose zone of manifestation the intertrabecular, intermuscular, and suprachoroideal spaces are expanded, and the fissures between the scleral fibers are increased. In addition, it is probable that stimulation occurs of physiological regeneration of the remaining elements of the drainage system due to suction of the products of destruction from the focus of crushing in the region of the action of the laser radiation.

The indicated changes testify to the expediency of using the ruby crystal Q-switched laser for treating glaucoma.

The damaging action of the argon laser was more local and limited mainly to the zone of direct action of the beam in which the structural elements of the filtering zone perished. In the sections directly adjacent to the site of coagulation there was an expansion of the intertrabecular fissures and scattering of the fibers of the sclera, probably governed by the heat effect and the nonuniform expansion of moisture in the intertrabecular spaces and trabeculae.

Our data confirmed the data of Vogel and Schildberg (1973) on the coagulation of tissue fragments in the zone of action of the argon laser, which indicates the expediency of using an argon laser for those types of pathology where a coagulation effect is necessary.

In a study of the damaging effect of the argon laser in a glaucomatous eye the need was found for a more careful study of laser action on the changed

pathological processes of the tissue, in particular on the altered and thickened trabecula. The degree of absorption of laser radiation depends, evidently, not only on the degree of tissue pigmentation, but also on the characteristics of the proteins comprising it (collagen, elastin, hyalin, and others).

Conclusions

1. Through openings in the trabecular tissue can be obtained as a result of the action both of ruby crystal Q-switched and argon lasers. Changes in the tissues of the drainage zone depend on the type of laser radiation.
2. In a comparative evaluation of the damaging effect of the ruby crystal Q-switched and argon lasers the first is characterized by a more pronounced effect of complete destruction of the trabecular tissue, as well as commotio changes around the focus, while the argon laser is characterized by a more local damaging effect and a lack of commotio changes.
3. The dominance of the mechanical component in the action of the ruby crystal Q-switched laser and the coagulation effect of argon radiation is confirmed by a quantitative evaluation of the damaged focus: the dimensions of the zone of complete destruction for the ruby crystal Q-switched laser were 125-625 m, of the zone of partial destruction--6-12.5 m; for the argon laser the dimensions of the zone of complete destruction--80 m, and the zone of partial destruction--250-280 m.

The authors are grateful to the Head of the Department of Soil Science of the Moscow State University, Corresponding Member of the USSR Academy of Sciences, Professor Ye. M. Sergeyev for making it possible to conduct studies in a laboratory of electron microscopy.

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FLUORESCENT ANGIOGRAPHY AND ARGON-LASER COAGULATION IN THE GRÖNBLAD-STRANDBERG SYNDROME

Moscow VESTNIK OFTAL'MOLOGII in Russian No 3, 1978 pp 30-32

[Article by Candidates of medical sciences E. G. Yeliseyeva, V. G. Dimitrova, N. N. Podgornaya, and O. K. Pereverzina, All-Union Scientific Research Institute of Eye Diseases of the USSR Ministry of Public Health and Department of Eye Diseases of the I. M. Sechenov First Moscow Medical Institute]

[Text] The development of the Grönblad-Strandberg syndrome is based on degeneration of the elastic fibers in the skin and the vascular wall of the entire organism (in generalization of the process), in the elastic layer of Bruch's membrane (eye symptoms) (Bock, 1938; Hagedorn, 1939; Klien, 1947). Both in the choroidea and in the vessels of other localization degeneration is noted in the elastic fibers which explains the massive organ hemorrhages; the compensatory increase in the smooth musculature results in obturation of vessels and makes them friable.

Vildi noted three stages in the clinical course of the disease. In the first stage on the fundus oculi a network is visible of red, gray-white, or brown lines and zig-zags that emerge radially from the grayish-white peripapillary ring. The lines are rather deep cracks which have jagged borders and varying pigmentation depending on the degree of the proliferative process. All the bands are located under the vessels of the retina and are distinguished from them by the fact that they are arranged almost on the level of the choroidea, in width up to 0.6mm. The macular region is not changed, and the sharpness of vision is normal. In the second stage to the clinical pattern of the first stage are added hemorrhages, transudates (primarily in the macular region) which result in a reduction in the sharpness of vision and stimulate the patients to go to an oculist. In the third stage cicatrization occurs as an outcome of subretinal hemorrhages. Connective tissue cicatrices in the form of stars in the center of the fundus oculi are the cause of central scotomata and result in an irreversible loss of vision. Secondary glaucoma is possible as a consequence of hemophthalmia, and amotio retinae.

Of definite diagnostic value is the method of fluorescent angiography. During Grönblad-Strandberg syndrome intensive, increasing, and stable fluorescence

in the region of the angioid bands in maintained for several minutes (over 15 minutes) indicating the degenerative affections of Bruch's membrane, and in the later phases fluorescein is spread diffusely over the edges of the bands washing their borders. Of a special importance is the method of fluorescent angiography in those cases where a tendency appears for the spread of angioid bands towards the macular zone, and dystrophic changes occur in the retina. The latter changes are of a secondary nature and cannot yet be differentiated ophthalmoscopically. In patients with early systems of the Grönblad-Strandberg syndrome the fundus oculi has the appearance of a so-called orange ring and is covered with yellowish-rosy spots which on the angiograms are hyperfluorescent. This makes it possible to distinguish the genuine angioid bands from certain conditions which are ophthalmoscopically similar to them (linear pigmentation, deep veins and so forth).

Conservative therapy of the given pathology is practically ineffective. It is based on timely diagnosis, removal of the focal infection, and control of anemia. For the first time in 1970 Offret proposed photocoagulation to treat this disease, after which in the literature reports appeared of 16 cases in which the possibility was achieved of stopping the development of the disease with the help of timely cicatrization of the vascular-like fissures in Bruch's membrane. Extremely unfavorable for photocoagulation is localization of the process in the macular region and in the papillomacular zone. With such localization of the process the use of argon laser coagulation is less dangerous. With an overdose of xenon photocoagulation, in cases of the use of applications in the region of the papillomacular bundle paracentral relative and absolute scotoma develops which can be united with the blind spot. New fissures appear, subretinal and intraretinal hemorrhages, and the sharpness of vision is reduced 0.3-0.4. Stimulation is possible of the subretinal neovascular membrane which was observed even after laser photocoagulation by Offret et al. (1970) and Francois et al. (1975). The authors believe that the progress of the disease and reduction in sharpness of vision occur as a consequence of the use of powerful energy on the thinned Bruch's membrane. We assume that probably the reason for the ineffective treatment is the insufficient quantity of applications without the corresponding working out of parameters.

During two years we studied 12 patients (22 eyes) with Grönblad-Strandberg syndrome who had been sent to the All-Union Scientific Research Institute of Eye Diseases of the USSR Ministry of Public Health with different diagnoses: consequences of chorioretinitis, complicated high myopia, dystrophic changes in the macular region, and chorioretinitis. The patients ranged in age from 29 to 57. In 9 of the 12 cases the process was two-sided, the second stage was diagnosed on the better eye (classification of Vildi), and the third stage of the disease on the worse eye. In the greater half of the patients there were pronounced specific, histologically confirmed changes in the skin of the chin, around the lips, in the region of the neck, and in the axillary space. Reduction in sharpness of vision on the affected eyes was governed by secondary changes in the macular region in the form of chorioretinal dystrophies as well as sub- and preretinal hemorrhages. In all the examined patients there was affection of the internal organs (gastrointestinal tract, liver, pancreas), one patient suffered from metrorrhagia, and in four patients transitory

hypertonia was observed. In both eyes of one patient with angioid bands in combination with high myopia we employed argon laser photocoagulation: in the right eye in the second-third stages of the disease, and in the left eye in the second stage. Sharpness of vision in the right eye equalled 0.2 with correction, and the left eye equalled 0.3 with correction. Fluorescent angiography indicated the typical pattern of angioid bands with serous filtration of the macular region and delay of evacuation of fluorescein from the venous vascular channel to 15 minutes (figure 1, 2, see the insert).

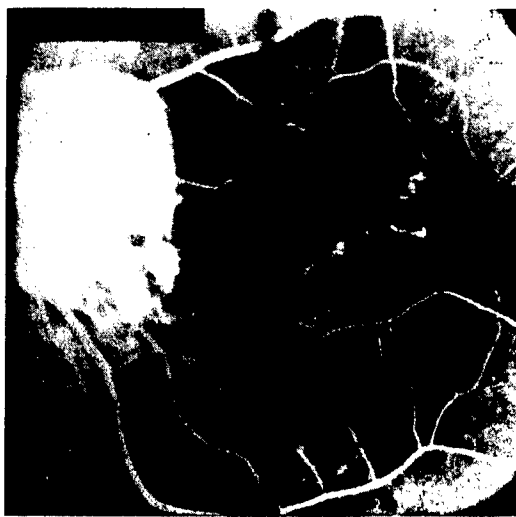


Figure 1. Arterio-venous phase. Y-shaped fissure in Bruch's membrane intersects the macular region.



Figure 2. Negative Dynamics of Disease within 4 Months. On the angiogram accumulation of fluorescein in the region of the angioid band.

A course of photocoagulation was conducted. After 10-30 days delicately pigmented coagula were discovered, a reduction in the dimensions and clarification of Fuchs's spot. The sharpness of vision of the right eye was improved from 0.2 to 0.4, and the left eye was maintained as before. Circulation was improved in the retinal vessels (time of circulation of fluorescein in the vascular bed of the fundus oculi was reduced to 3 minutes, accumulation of fluorescein in the central zone of the fundus oculi was not noted) (figure 3, see the insert).



Figure 3. Condition after Argon Laser Coagulation. Late venous phase. The traces of coagula are visible. Accumulations of fluorescein in the area of the fissure, intersecting the macula, are not observed.

On the background of vasodilating, vasostrengthening, and vitamin therapy the process was stabilized, and in the course of the year no negative dynamics in both eyes was observed. The sharpness of vision was maintained as before, and foci of exudation were not revealed on the fundus oculi by the method of fluorescent angiography. There was no tendency towards an increase in the dimensions and the number of angioid bands on the fundus oculi.

The results of treatment permit us to join the opinion of Mayer-Schwickerath that the risk of using argon laser coagulation should be considered justified. However indications for laser photocoagulation during Grönblad-Strandberg syndrome must be individual, and very cautious in regard to a number of moments. Applications should be made along the angioid bands, retreating from the edge to the diameter of application. The power of the light beam is

maintained within 150-200 w, with minimum exposure (0.050-0.10 s). From our viewpoint these conditions of argon laser coagulation create as far as possible sparing conditions for the altered Bruch's membrane and pigment epithelium.

Thus active intervention with the help of argon laser coagulation during Grönblad-Strandberg syndrome indicated the expediency of using it to achieve the stabilization of the process, as well as for prevention of the emergence of secondary changes on the fundus oculi.

Conclusions

1. Fluorescent angiography is a valuable diagnostic method that makes it possible to find latent starting, ophthalmoscopically invisible changes on the fundus oculi of a secondary nature, especially their localization in the macular region, by expanding the indications for the use of argon laser coagulation.
2. Fluorescent angiography makes it possible to evaluate the dynamics of the process, especially with the use of argon laser coagulation.
3. Argon laser coagulation is promising in the stabilization of the process, especially in the early stages.
4. The timely use of argon laser coagulation during Grönblad-Strandberg syndrome will make it possible to prevent the development in the macular region of course, irreversible, dystrophic changes of a secondary nature.

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MICROSURGICAL TECHNIQUE OF REMOVING FOREIGN BODIES FROM THE POSTERIOR SECTION OF THE EYE

Moscow VESTNIK OFTAL'MOLOGII in Russian No 3, 1978 pp 33-34

[Article by V. P. Bykov, and A. A. Malayev, Department of Traumatology and Reconstructive Surgery of the Helmholtz Moscow Scientific Research Institute of Eye Diseases]

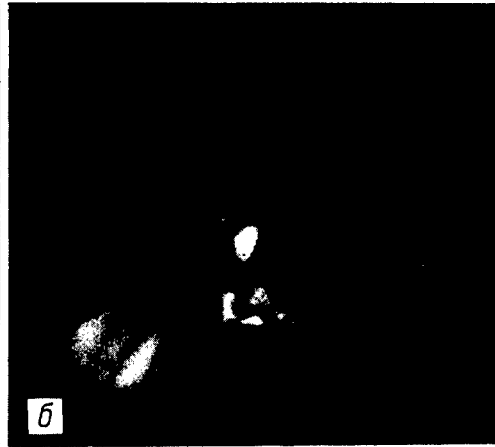
[Text] The methods of removing "stationary" slivers from the posterior section of the eye are being constantly perfected, but unfortunately, the results of the operations in the majority of cases are very uncomfortable. Due to the difficulties of the direct approach to the sliver through the sclera often it is not successfully removed, and the operation is sometimes the cause of the death of the eye (M. L. Krasnov; A. I. Gorban' and O. A. Dzhaliashvili; R. A. Gundorova and F. Ye. Fridman; V. V. Volkov and A. I. Mikhaylov; and R. A. Gundorova, G. A. Petropavlovskaya; Neubauer; William, et al.).

The modern ophthalmological surgical technique, apparatus and instruments significantly expand the potentialities for the sparing removal of foreign bodies from sections of the eye that are difficult to reach, therefore we considered it expedient to share our own observations that concern three cases of the removal of slivers from the posterior pole of the eye.

Patient F. Diagnosis: right eye--intraocular foreign body penetrating the corneo-scleral cicatrix. Left eye healthy. Objectively refracting media transparent, on the fundus oculi a black metallic sliver is visible that has penetrated the membrane and disc of the optic nerve (figure 1, see insert). Sharpness of vision of the right eye at entrance--0.6, not corrected, with extraction--0.7.

Patient R. Diagnosis: left eye-intraocular foreign body penetrating the cicatrix of the sclera. Right eye healthy. Objectively: sama as patient F. (figure 2, see insert). Sharpness of vision of left eye upon entrance--0.7-0.8, with extraction--0.7.

Patient P. Diagnosis: right eye--intra ocular foreign body penetrating the cicatrix of the sclera. Objectively: refracting media transparent, on fundus



(Key on next page)

Figure 1. Fundus Oculi of Patient F.

Key:

a--before operation: foreign body in disc of optic nerve;
b--within seven days after operation: residues of capsule of foreign body visible.

Figure 2. Fundus Oculi of Patient R. before Operation. Foreign body in disc of optic nerve.

Figure 3. Fundus Oculi of Patient R. within Seven Days after Operation. Preretinal adhesion visible in corpus vitreum

oculi (premembrane) next to the macula a small foreign body (brass). Sharpness of vision upon entrance and upon extraction--0.8.

In the first two patients a multiple attempt was made to transfer the foreign bodies to the region of the denticulated line with the help of a powerful electromagnet. Localization of the slivers in relation to the membranes was pinpointed by x-ray and with the help of echo ophthalmography.

Taking into consideration the progress of metal poisoning revealed electrophysiologically and clinically in all the patients an operation was conducted for removal of the intraocular foreign bodies with approach through the flat section of the ciliary body. The foreign bodies were removed. The post operational period in all cases occurred without complications. In one case in 30 seconds after the removal of the sliver a hematoma appeared, in size barely larger than the disc of the optic nerve. This hematoma was reabsorbed by the end of the second week after the operation.

The pattern of the fundus oculi of the first and second patient within 7 days after the operation is apparent on figure 1, 2 and 3, see the insert. All of the patients were seen in the clinic. The period of observation was 3-4 months.

The technique for the operation in all patients was the same: the conjunctiva was cut in the upper-outer (or upper-inner) quadrant, and separated. The sclera was cut to the vascular membrane 3mm in length, parallel to the limbus 5-6mm from it. A contact lens-sucker was placed on the cornea (from the set for vitreoectomy) for direct ophthalmoscopy with the help of a binocular microscope equipped with a coaxial illuminator (OPMI-6, MELLER-VEDEL'). The microscope was focused with low magnification so that the fundus oculi was clearly visible, and the depth of sharpness remained great.

Under visual control through the cut in the sclera exactly in the direction of the sliver Neubauer tweezers were inserted with closed clamps (figure 4).

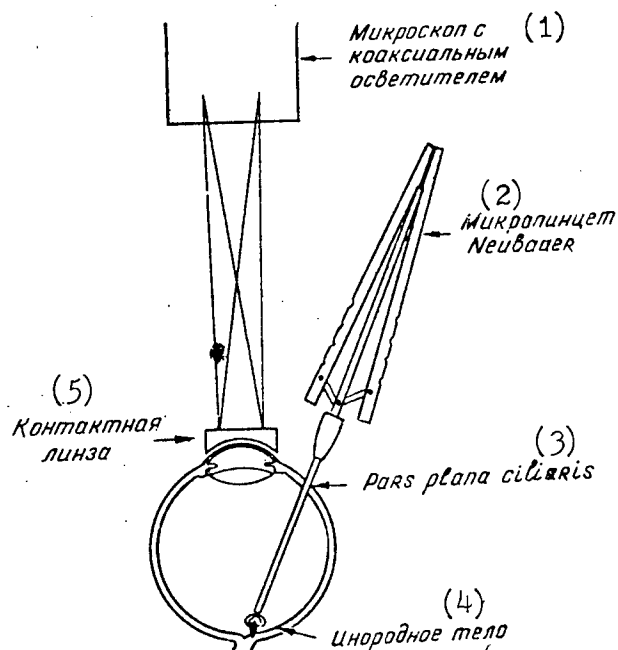


Figure 4. Scheme of Operation to Remove Foreign Body.

Key:

- | | |
|---|-----------------|
| 1. Microscope with coaxial illumination | 4. Foreign body |
| 2. Neubauer microtweezers | 5. Contact lens |
| 3. Pars plana ciliaris | |

After the clamp of the tweezers was brought to the foreign body the magnification ratio of the microscope was increased with the help of a trans-focuser so much that individual details in the surface of the sliver became visible, and the inflammatory torus around it. After this the sliver was reliably snatched by the clamps of the tweezers and slowly removed from the eye. A Π -shaped caprone suture was placed on the wound of the sclera. Prolapse of the corpus vitreum in the wound in all cases was not observed.

The described observations are important because with the help of modern apparatus practically unremovable foreign bodies were removed without complications which underlines the extensive potentialities micro-ophthalmological surgery in treating patients with foreign bodies in the eye.

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HEALING OF CORNEAL WOUNDS DURING EXPOSURE TO AN EXPERIMENTAL PERMANENT
MAGNETIC FIELD

Moscow VESTNIK OPTAL'MOLOGII in Russian No 3, 1978 99 34-37

[Article by G. G. Kal'met'yev, T. S. Ivanova, and Yu. I. Kiyko, Ufa Scientific Research Institute of Eye Diseases]

[Text] A permanent magnetic field differs by the diversity of the effect on the organism. In therapeutic doses it has a pain-alleviating, spasmolytic, neurotrophic, reabsorbing and anti-inflammatory action, and accelerates the processes of regeneration (Yu. A. Kholodov, 1966; M. F. Murav'yev, 1969; I. L. Degen; 1970; A. A. Tyuryayeva et al., 1974; Ye. S. Vaynshteyn et al., 1976).

The purpose of the study was an experimental investigation of the effect of a permanent magnetic field on the course of the wound process in the corneal membrane. The work used magnetophores that are the source of a biologically active magnetostatic field with voltage 160-300 oersteds. The experiment used 48 rabbits of the chinchilla breed weighing from 1.2-2.5kg. The operations were conducted under the control of an operation microscope. With a knife edge in the center of the cornea a penetrating wound was made 5-6mm long. In the first series of experiments primary surgical treatment was not conducted, and in the second series knotty, supramid sutures were applied. After the operation for 14 hours daily before enucleation an aseptic bandage was applied with the magnetophores placed in layers. The eyes were enucleated on the 7th, the 14th, and 30th days fixed in formalin, cast in paraffin, stained with hematoxylin-eosin, and toluidine blue with enzyme control by testicular hyaluronidase. For the purpose of comparison of the width of the regenerating layer of epithelium and the corneal tissue in the stroma of the cornea microscopy was used in subsequential mathematical processing.

The epithelium of the corneal membrane above the wound canal was restored on the seventh day, and was arranged in a form of a uniform sheet in 6-7 layers. In rabbits of the control group the epithelium was restored, but the regenerating layer was less uniform, and was deepened according to the wound canal. Micrometrically the thickness of the epithelial layer in the test was $0.036 \pm 0.001\text{mm}$,

and in the control group $0.046 \pm 0.003 \text{ mm}$. A more significant difference was found in the condition of the wound canal. In the animals of the test group its adaptation occurred, the connective tissue sheets of the stroma were arranged parallel, densely, edema was insignificant, more in the posterior section, and the endothelium was presented in the form of a single layer. Reactive phenomena around the supramid threads were not found. In animals of the control group complete adaptation of the wound canal was not noted. In the anterior section of the keratocytes and keratoblasts were arranged in the form of a sheet. In the middle and posterior third of the wound a fibrinous clot was located which was limited on the side of the anterior chamber by proliferating endothelium. The sheets of stroma adjacent to the wound canal were stained hypochromatically, they were swollen and intersheet edema was pronounced. For the length of the wound canal accumulation of cellular elements was observed: neutrophils, single macrophages; around the supramid sutures there were single lymphocytes. Micrometrically the width of the wound canal in the test group was $0.167 \pm 0.021 \text{ mm}$, and in the control-- $0.353 \pm 0.027 \text{ mm}$ (figure 1).

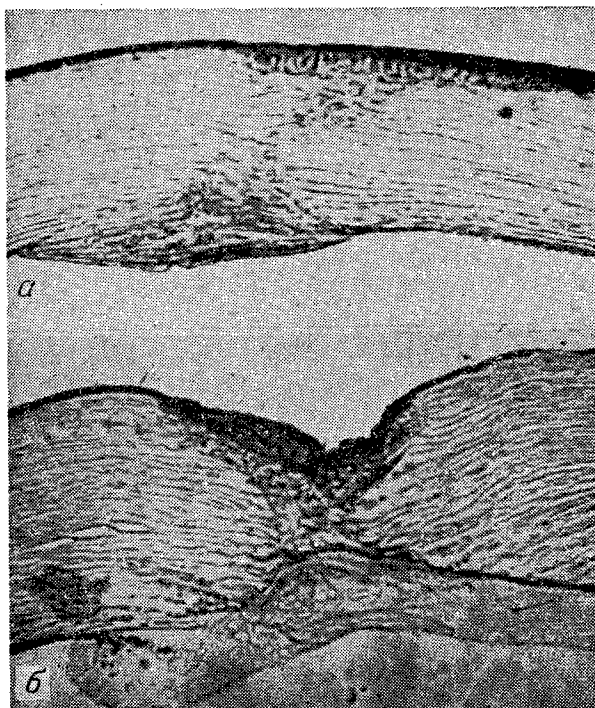


Figure 1. Healing Wounds of Corneal Membrane during Exposure to Permanent Magnetic Field. Seventh day after operation.

Key:

a--experiment, wound canal has adapted, epithelial sheet is uniform, edema in the posterior third of the cicatrix. б--control, adaptation of wound canal has not started, between its edges a fibrous clot.

Study of the cicatrix tissue in the corneal membrane within two weeks indicated that the regenerating sheet of epithelium over the wound canal in the test and the control groups morphologically differed insignificantly, the difference in micrometry was unreliable. In the stroma of the corneal membrane formation of a cicatrix occurred, whose width in the experimental

group was $0.157 \pm 0.011\text{mm}$, and in the control group-- $0.319 \pm 0.039\text{mm}$. The sheets of the stroma were arranged compactly and parallel, the keratocytes and keratoblasts--in the form of a narrow column along the course of the wound canal. Around the supramid sutures there was slightly pronounced inflammatory infiltration by lymphocytes, and epithelioid cells. In the control group adaptation of the wound canal occurred, but the cicatrix tissue, especially in the posterior section of the cornea was loose, edema was preserved, and in individual cases there were fibrinous clots between the fibers of the stroma. Along the course of the wound canal there were a large number of fibroblast elements, and around the supramid threads--pronounced lymphoid-epithelioid infiltration (figure 2).

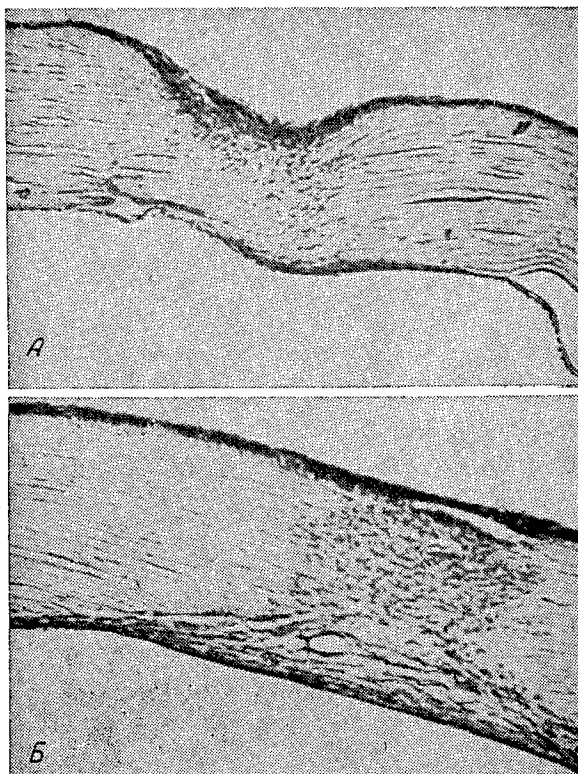


Figure 2. Healing of Wounds of Corneal Membrane during Exposure to Permanent Magnetic Field. 14th day after operation.

Key:

a--experiment, formation of connective tissue cicatrix in stroma. б--control, broad connective tissue cicatrix of cornea, edema, neoplastic vessels, fibrin in the posterior third of the cicatrix.

Within one month in the rabbits of the test group a soft cicatrix had formed, micrometrically its width $0.100 \pm 0.009\text{mm}$. The epithelium above the wound canal had pronounced differentiation of the layers, the sheets of the stroma were arranged densely, and parallel, and the endothelium was in the form of one layer of cells. The moderate infiltration around the supramid sutures

was maintained. In the animals of the control group a cicatrix was also formed, but wider ($0.286 \pm 0.023 \text{ mm}$) with a large number of fibroblast-like cellular elements, neoplastic blood vessels, and inflammatory infiltration around the sutures (figure 3).

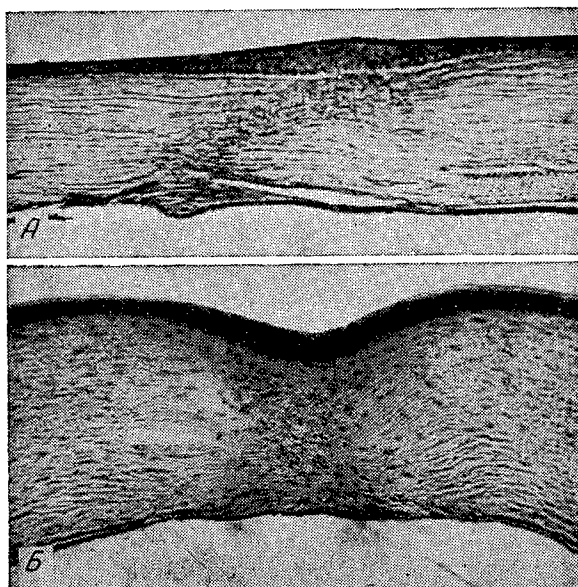


Figure 3. Healing of Wounds of Corneal Membrane during Exposure to Permanent Magnetic Field.

30th day after operation.

Key:

a--experiment, thin vesselless cicatrix in stroma of cornea.

b--control, cicatrix tissue of stroma of corneal membrane.

Staining with hematoxylin-eosin. Magnification X 56.

Histochemical shifts in the region of the corneal wound on the seventh day of the experiment were characterized by the appearance of an intensive focal alpha- and gamma-metachromasia on the background of beta-metachromatic staining of the stroma of the corneal membrane; on the 14th day of the experiment an increase in intensity in metachromasia was not observed; and on the 30th day it was reduced. In contrast to the experiment in the control the intensity of metachromasia was markedly lower, and gamma-metachromasia was not observed. Treatment of the sections with hyaluronidase produced a diffusion reduction in intensity of metachromasia which completely did not disappear.

Conclusions

1. For the first time an investigation was made of the effect of a permanent magnetic field (PMF) on the healing of corneal wounds on the condition of their satisfactory adaptation.

2. It was found that PMF has an effect on the restoration on the epithelium in the early periods, thus promoting the formation of a more uniform regenerating sheet. Further, there was no principal difference in the morphological pattern of the epithelium.

3. A more significant effect of PMF was observed on the formation of the connective tissue cicatrix in the stroma. An early inverse development of edema was observed, reabsorption of the fibrous clot, on the seventh day complete adaptation of the wound canal occurs, and on the 30th day formation of a thin, vessel-less cicatrix of the cornea occurs. Apparently the effect of PMF on the wound process is based on a more intensive synthesis of acid mucopolysaccharides which promotes a rapid and higher quality healing of wounds of the cornea.

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SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

GENERAL SMIRNOV AND COLONEL GULYAKIN HONORED

[Article: "For Contribution to the Development of Soviet Military Medicine"]

Moscow MEDITSINSKAYA GAZETA in Russian 1 Mar 78 p 1



[Text] By an ukase of the Presidium of the Supreme Soviet of the USSR, Academician Yefim Ivanovich Smirnov, member of the USSR Academy of Medical Sciences, an outstanding worker in Soviet health care, colonel-general of the Medical Service, was awarded the title of Hero of Socialist Labor. This high award was given Yefim Ivanovich by the Motherland for his great contribution to the development of Soviet military medicine and for the great part he had played in supporting military operations of the troops during the Great Patriotic War.

In 1939-1946 Ye. I. Smirnov headed the Medical Service of the Soviet Army, acting as chief of the General Military Hygiene Department. From 1947 till 1952, he was the USSR Minister of Health Care. Now he occupies one of the leading posts in the Armed Forces.

The important achievement of Ye. I. Smirnov in the organization of civilian and especially military health care is the comprehensive scientific basis for the organizational forms of medical care of the population and medical service provided to the Armed Forces of the USSR. He initiated the in-depth of the history of our country's military medicine. Under his direct leadership the general military field-medicine doctrine was developed during the years preceding the war. This doctrine established a unified approach to the origin, progress and treatment of pathological processes and allowed implementation of continuous treatment of the wounded and other patients at

all stages of evacuation for medical reasons according to standardized, scientifically verified methods which were acceptable under field conditions. It was only due to this system of methods which was accurately implemented in the process of military troop activities, that the following strikingly successful results were achieved more than 72 percent of the wounded and 90 percent of the sick were returned to active service. Through this, the Medical Service of the Armed Forces of the USSR greatly contributed to the defeat of the enemy.

Ye I. Smirnov is the author of a number of major scientific research works devoted to the problems of health care. He wrote an outstanding work summarizing the experience of the Medical Service at the time of the Great Patriotic War: "War and Military Medicine."

* * *



In 1941 Mikhail Gulyakin graduated from the Medical Institute and immediately rose to the front as the Commander of the Medical Service of the Separate Battalion of the 1st Paratrooper Corps.

"My schooling was at the front," says Mikhail Filippovich. Dreaming of being a surgeon, M.F. Gulyakin while still a student, had done simple surgical operations under the guidance of his teacher. But here, at the front, he at once had to work all by himself.

During the war, Mikhail Filippovich performed 14,000 operations. Out of this number, 3,200 were on wounds in the chest and abdomen. This determined the direction of his post-war work. He went into the most difficult types of surgery.

"The surgeon's heart must beat together with the patient's" - these are the words which Mikhail Filippovich likes to repeat. This is the principle of his life and his professional work.

While still the chief of a department, he organized a postsurgical convalescent ward. Now it is used as a base for anesthesia and resuscitation center of the hospital. M.F. Gulyakin headed the organizing of a hypoxobarotherapy laboratory.

M.F. Gulyakin struggled for the lives of soldiers in the battles of Moscow; Stalingrad; Kursk; the Baltic, during the "Bagration" operation; and abroad when our army was in its great liberation expedition. Now too he is struggling for the lives of people together with his colleagues and students.

On the eve of the 60th anniversary of the Armed Forces of the USSR, the Head Oncologist of the Military Hospital imeni N.N. Burdenko Colonel of the Medical Service Mikhail Filippovich Gulyakin was awarded the high title of Hero of Socialist Labor. Once again the words of M.I. Kalinin have been confirmed, that the Medical Service of our Army is as important as Air Force and artillery services, that physicians in the ranks of our army are as needed as soldiers and commanders. So, they - soldiers, commanders and physicians- are equally honored.

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SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

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ALL-RUSSIAN CONGRESS OF INFECTIOUS DISEASES SPECIALISTS

Moscow SOVETSKAYA MEDITSINA in Russian No 5, 1978 pp 146-148

Report on congress by V. N. Nikiforov, corresponding member of the USSR Academy of Medical Sciences, and Prof I. N. Shchetinina (Moscow)

Text The first all-Russian congress of infectious diseases specialists was held on 27 to 29 September 1977 on the eve of the celebration of the 60th anniversary of the Great October Revolution, when the entire Soviet nation summed up the fulfillment of socialist obligations, implementing the historical decisions of the 25th Party Congress.

A total of 341 delegates and 40 guests from various cities, oblasts, krays and autonomous republics in the Russian Federation, as well as about 600 medical men from the Bashkirskaya ASSR, were present at the congress. The country's leading scientists were among the delegates: Prof V. N. Nikiforov, chief infectious diseases specialist of the RSFSR Ministry of Health, chairman of the RSFSR All-Russian Scientific Society of Infectious Diseases Specialists, corresponding member of the USSR Academy of Medical Sciences; Prof V. I. Pokrovskiy, chief infectious diseases specialist of the USSR Ministry of Health, corresponding member of the USSR Academy of Medical Sciences; Prof A. F. Bilibin, Prof K. V. Bunin and Prof N. I. Nisevich, academicians of the USSR Academy of Medical Sciences; Prof Ye. P. Shuvalova, corresponding member of the USSR Academy of Medical Sciences and others.

The following took part in the congress work: Prof K. I. Akulov, RSFSR deputy minister of health; N. N. Vavulina, chief of the Main Administration of Therapeutic and Preventive Assistance of the RSFSR Ministry of Health; A. N. Zharikov, head of the division of infectious diseases of the USSR Ministry of Health; I. S. Bezdenezhnykh, chief epidemiologist of the RSFSR Ministry of Health; M. Kh. Kamalov, Bashkirskaya ASSR minister of health; I. G. Kurbangaleyeva, Bashkirskaya ASSR deputy minister of health, Prof A. Ya. Lysenko, chief parasitologist of the USSR Ministry of Health; Prof I. I. Sivkov, editor-in-chief of the journal SOVETSKAYA MEDITSINA.

Among the delegates to the congress there were 59 chief infectious diseases specialists from the oblasts, krays and autonomous republics of the RSFSR. A total of 157 workers at medical and scientific research institutes (including 62 heads of departments of infectious diseases), 140 general

practitioners--infectious diseases specialists and pediatricians--as well as public health organizers, epidemiologists, microbiologists, parasitologists and therapists participated in it.

The report "The State of the Infectious Disease Service in the Russian Federation and the Prospects for its Development" by N. N. Vavulina, chief of the Main Administration of Therapeutic and Preventive Assistance of the RSFSR Ministry of Health, was heard at the first meeting. It thoroughly discussed the tasks of the infectious diseases service during the Tenth Five-Year Plan, the indicators of the state of the infectious diseases service throughout the Russian Federation and individual oblasts, krays and autonomous republics, the data on infectious morbidity and the advances in the control of infections, noted the need to improve the skills of infectious diseases specialists and the importance of the application of scientific achievements in the diagnosis and treatment of infectious diseases and examined other problems important for the science and practice of public health. It mapped out the ways and gave specific recommendations for scientific planning, organizational and methodological work, improvement in the organization of the infectious diseases service in the Russian Federation and the prospects for its development. Plenary meetings were devoted to the problem of acute intestinal infections (dysentery, salmonellosis, typhoid fever and intestinal infections in children) and intestinal invasions. Furthermore, the problems of deontology in the practice of the infectious diseases specialist were examined at one of these meetings. The following two reports were heard with interest and great attention: "Deontological Aspects of Treatment" (A. F. Bilibin, academician of the USSR Academy of Medical Sciences) and "Deontology in the Practice of the Infectious Diseases Specialist" (Prof Ye. P. Uzhinova).

The program report by Prof V. I. Pokrovskiy, corresponding member of the USSR Academy of Medical Sciences, devoted to the urgent problems of dysentery, stressed that acute intestinal infectious diseases continue to remain one of the most important public health problems in the overwhelming majority of the countries in which this disease occupies a special place both in the extent of its spread and social and economic damage. Having illuminated the problem of dysentery as a whole, the speaker raised a number of problems important for science and practice (in particular, the problem of the nomenclature and classification of dysentery) and noted the significant epidemiological and clinical differences in its individual nosological forms (Grigor'yev's-Shiga's, Flexner's, Newcastle's and Sonne's), the distinctions in the patterns of spread and the significant variation in the efficiency of the implemented preventive and antiepidemic measures. He paid much attention to the medicinal resistance of the causative agents of dysentery, to the change in their virulence and to intracellular parasitism. The pathogenesis of dysentery was examined in detail, new interesting data obtained by Prof V. I. Pokrovskiy's associates during a study of the functional state of the gastrointestinal tract and of some other indicators were presented, the role of cyclic nucleotides (in particular, cyclic AMP) in the pathogenesis of dysentery was analyzed in detail and the role of disturbances in the eubiosis of the intestine

and of autosensibilization reactions was noted. The peculiarity of the adaptation syndrome in patients suffering from dysentery was detected. The problems of immunity of dysentery, diagnosis and differential diagnosis and rational antibacterial and pathogenetic therapy were also discussed in the report. The need for a differentiated approach to the prescription of chemopreparations with the preference of nitrofurans, of which a negative effect on the repair of the mucous membrane of the intestine is not typical, was shown on the basis of extensive factual data. With regard to antibiotics, short (2- to 3-day) courses proved to be clinically more effective as compared with prolonged courses. On the basis of observations it was concluded that the formation of acute carriage is the same in patients treated with tetracycline and furazolidone and in those who do not receive etiotropic preparations.

At the plenary meeting on the problem of "dysentery" held under the chairmanship of Prof V. I. Pokrovskiy and Ye. P. Shuvalova all the important aspects of this problem were discussed in detail.

The program report by K. V. Bunin, academician of the USSR Academy of Medical Sciences, discussed various aspects of the problem of salmonellosis, which is of great importance for medical science and practice. A classification of their clinical forms based on modern concepts of salmonellosis and its most important pathogenetic characteristics, a classification convenient for practice, was presented. Examining the problems in the diagnosis of salmonellosis, the speaker stressed the role of key syndromes in identifying this disease and in making a differential diagnosis. He enumerated its fundamental principles and indicated that, along with the use of bacteriological methods of patient examination, immunological examinations, especially the determination of the titers of serum antibodies in the indirect hemagglutination reaction, contribute to the refinement of a diagnosis. The speaker paid principal attention to the pathogenesis, state of immunity and rational pathogenetic therapy of patients suffering from salmonellosis. He dwelled in detail on the most important pathogenetic mechanisms characteristic of the course of salmonellosis and singled out the syndromes of intoxication, of the disturbance in the water and electrolytic balance and in the acid base equilibrium and of kidney affection and the hormonal disorders caused by the toxic effects on the adrenal cortex. The speaker cited new data, obtained in the clinic directed by him, on the role of cyclic nucleotides (including cyclic AMP) in the development of the diarrhea syndrome and toxicosis, because the permeability of the membranes in epithelial cells is disturbed. Using factual data of his own research on the determination of the indicators of cyclic AMP in the blood and urine of patients suffering from salmonellosis, K. V. Bunin quite convincingly substantiated the importance of these biochemical factors in the pathogenesis of this disease. Having analyzed the rational pathogenetic therapy used in salmonellosis, he warned the participants in the congress against an unsubstantiated use in this disease of antibiotics and chemotherapeutic preparations, which proved to be totally ineffective. At the same time, on the basis of the results of clinicobiochemical and instrumental examinations of

patients suffering from salmonellosis he convincingly substantiated the advisability of subjecting them to pathogenetic therapy, especially the use of polyionic salt solutions and blood substitute preparations of dis-intoxifying action. The speaker mapped out the ways for a further study of the problem of salmonellosis for the purpose of improving the diagnosis and effectiveness of treatment.

Many urgent problems of salmonellosis were also examined at the plenary meeting directed by Prof K. V. Bunin and Ye. P. Uzhinova. In addition to the program report by K. V. Bunin, Prof A. F. Podlevskiy's report on the characteristics of the clinical course, diagnosis and treatment of typhoid fever at the present stage was heard.

The program report by N. I. Nisevich, academician of the USSR Academy of Medical Sciences, and A. G. Avanesova, doctor of medical sciences, presented a clinicoetiological description of intestinal infections in children. Having examined this problem in detail, the speakers stressed the diversity of the etiological structure, pointed out the relative significance of each infection in the structure of acute intestinal infections from the age aspect, described the characteristics of the clinical course of dysentery and salmonellosis and noted the tendency of Sonne's dysentery toward a prolonged bacterial carriage at the present stage. They dwelled in detail on acute intestinal infections in children during the first year of life, drawing attention to the change in the etiological structure of escherichiasis toward an increase in the relative significance of serotypes of the second category. They stressed the predominance of children of young age among patients suffering from salmonellosis and the increase in the relative significance of the salmonellae typhi murium, which caused a more severe course of the disease. The speakers analyzed in detail the course of the disease during an unestablished etiology of an intestinal disease and discussed the problem of competence of the diagnosis "food toxicoinfection" and the need for a laboratory confirmation of the diagnosis "intestinal infection." Urgent problems of the diagnosis, differential diagnosis and treatment of intestinal infections of varying etiology in children were discussed at this plenary meeting under the guidance of Prof N. I. Nisevich and Prof N. R. Ivanov.

The program report by M. I. Alekseyeva, K. M. Loban and A. Ya. Lysenko was devoted to intestinal invasions. It pointed out the relative significance of various invasions in intestinal pathology, analyzed the incidence of various helminthiasis, presented new data on the pathogenesis of intestinal helminthiasis and on the clinical and laboratory manifestations of early and acute phases of intestinal invasions, as well as the chronic stage of helminthiasis, and described the difficulties in identification, differential diagnosis and principles of treatment. The report evoked great interest both among parasitologists and infectious diseases specialists, which stressed the advisability for a further joint discussion of the problem of intestinal invasions, as well as the need for a joint observation of patients with intestinal invasions in offices for infectious diseases. The delegates

to the congress also heard a report by Prof D. M. Dalmatov, who described the characteristics of the clinical picture and treatment of combined intestinal infections and opisthorchosis.

During a discussion of the problem of intestinal invasions under the chairmanship of Prof K. M. Loban and D. M. Dalmatov the importance of a cooperative activity of infectious diseases specialists and parasitologists, as well as the need for a more extensive publication of data on intestinal invasions in journals, was substantiated.

A report by Prof V. N. Nikiforov, chairman of the board of the All-Russian Scientific Society of Infectious Diseases Specialists, corresponding member of the USSR Academy of Medical Sciences, on the work of the board of this society, a report by Prof S. N. Sorinson, chairman of the audit commission, and a report by Prof I. I. Sivkov, editor-in-chief of the journal SOVETSKAYA MEDITSINA, on the work of the editorial board were heard at the plenary meeting devoted to organizational problems. Elections for the board of the All-Russian Scientific Society of Infectious Diseases Specialists and for the audit commission were held.

The resolution adopted by the congress drew special attention to the improvement in antiepidemic work on the control of infectious diseases in the Russian Federation in the last few years and to the strengthening of the republic's infectious diseases service and noted the achievements of the republic's scientists in the area of diagnosis, treatment and prevention of a number of infectious diseases and introduction of scientific achievements into practice, the active work of most chief infectious diseases specialists of krais, oblasts and autonomous republics, the expanded popularization of advanced experience by scientific societies, the important role of the system of improvement of skills of infectious diseases specialists and the growth of the material and technical base of infectious diseases hospitals and departments. It pointed out the advisability for a further increase in the overall nature of scientific research on the problems of diagnosis, pathogenesis, immunology and treatment of infectious diseases and stressed the importance of a systematic improvement in the skills of infectious diseases specialists, therapists, pediatricians and district physicians in the area of early diagnosis of infectious diseases, as well as in urgent assistance for patients suffering from infectious diseases.

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